Chapter 5
Other Required Disclosures

Other required disclosures of environmental documents include irreversible and irretrievable commitment of resources; the relationship between short-term uses and long-term productivity; growth inducing impacts; summary of environmental impacts by alternative; significant and unavoidable impacts; and the environmentally superior alternative.

5.1 Irreversible and Irretrievable Commitment of Resources

According to the National Environmental Policy Act (NEPA), an environmental impact statement (EIS) must contain a discussion of irreversible and irretrievable commitment of resources that would result from the Proposed Action if it was implemented (40 CFR Section 1502.16). The irreversible commitment of resources generally refers to the use or destruction of a resource that cannot be replaced or restored over a long period of time. The irretrievable commitment of resources refers to the loss of production or use of natural resources and represents lost opportunities for the period when the resource cannot be used. The California Environmental Quality Act (CEQA) also requires a discussion of any significant effect on the environment that would be irreversible if the project were implemented or would result in an irretrievable commitment of resources (CEQA Guidelines Section 15126(c)).

Dam removal, deconstruction, construction, and restoration activities under the Proposed Action and the Klamath Basin Restoration Agreement (KBRA) programs and plans would involve the consumption of nonrenewable natural resources. These nonrenewable natural resources would consist of petroleum for fuels necessary to operate equipment used during deconstruction activities. The Proposed Action would include removal of four dams and all power generation facilities. This would result in the generation of waste from the concrete, mechanical, and electrical items at the dams and power facilities. Petroleum fuels would be used to haul these materials to disposal sites in the project area. In addition to fuels used in transportation, the use of the disposal sites would constitute an irreversible and irretrievable commitment of resources. Concrete and earthen materials would be used as backfill to bury dam structures, backfill the excavated tailrace channels, and restore the river to its pre-dam appearance. These materials would be permanently committed during implementation of the proposed action. Construction activities necessary for implementation of KBRA programs and plans would require the use of nonrenewable natural resources including petroleum for fuels and other construction materials.

5.2 Relationship Between Short-Term Uses and Long-Term Productivity

As required by NEPA (40 CFR Section 1502.16), this section describes the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity.

5.2.1 Klamath Hydroelectric Settlement Agreement

All four action alternatives involve demolition and/or construction activities including removing the dams and power generation facilities or constructing fish passage facilities. Dam removal (Under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative) and the construction of fish passage facilities (under the Fish Passage at Four Dams and Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternatives) would require short-term uses of capital, labor, fuels, and construction materials, as well as the creation of temporary new access roads and storage pads needed during deconstruction activities.

Removal of reservoirs at the Four Facilities under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would benefit water quality by converting existing reservoir areas to a free-flowing river. Klamath Hydroelectric Project reservoirs have been shown to create higher water temperatures than those that would occur under natural conditions. Therefore, removal of the dams and return of the reservoirs to a natural flowing river would result in long-term beneficial effects on water temperature and overall water quality. In turn, improvements in water quality could result in improvements in scenic resources, such as water clarity or fish viewing opportunities. Further, removal of the reservoirs could result in beneficial impacts on dissolved oxygen and pH levels in the water, thus increasing the likelihood of the free-flowing river consistently supporting beneficial uses. Other benefits to long-term productivity could result from decreases in the levels of microcystin and chlorophyll-a concentrations.

As described above, implementation of the Proposed Action would result in the drawdown and removal of reservoirs at the Four Facilities and would eliminate reservoir recreational opportunities at these sites. However, improved water quality as well as the return of the Klamath River to free-flowing river conditions would also result in benefits for other water-contact-based recreational opportunities, including recreational fishing and some whitewater boating.

Long-term beneficial impacts would also occur for aquatic resources under the Proposed Action, the Partial Facilities Removal Alternative, the Fish Passage at Four Dams Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative. Changed habitat conditions resulting from dam removal would reduce impacts on salmonids from fish disease and parasites. Long-term changes to the flow regime of the Klamath River (under the Proposed Action and the Partial Facilities

Removal Alternative) would benefit fall-run Chinook using the Lower Klamath River Reach. In addition, the absence of the dams would provide access to 420 miles of additional habitat upstream of Iron Gate Dam, including at least 30 miles in tributaries such as Fall, Jenny, Shovel, and Spencer creeks, among others. Under the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative, flow increases would provide more habitat than under existing conditions for redband/rainbow trout and other resident riverine species, as well as any anadromous fish or lamprey that reestablish in the Hydroelectric Reach, but habitat gains would be less than under the Proposed Action. While removal of the two dams would eliminate existing habitat in Copco 1 and Iron Gate Reservoirs for adult shortnose and Lost River suckers, habitat within J.C. Boyle Reservoir would remain and higher flow releases would be made through the J.C. Boyle bypass reach than under existing conditions. Higher baseflows would also be provided in the Copco 2 bypass reach. These modifications would provide a benefit for fish living in this reach, including redband trout and anadromous fish. Dam removal would also restore habitat connectivity on the mainstem Klamath River and create additional habitat within the Hydroelectric Reach, thus increasing long-term productivity of coho and Chinook salmon, steelhead, and Pacific lamprey. Increases in fish populations would also result in beneficial impacts for scenic fish viewing, recreational fishing, and conditions for species traditionally and culturally important to American Indian tribes.

Under the Fish Passage at Four Dams Alternative, long-term fishery productivity would increase in the basin due to water quality improvements from implementation of Oregon and California Total Maximum Daily Loads (TMDLs). Under this alternative, the hydrology of the Klamath River from Iron Gate Dam to the Klamath River Estuary would generally remain the same as existing conditions; however, fish would be able to migrate past the dams and would gain access to substantial areas of additional habitat. This access could still be delayed or impaired at the ladders, and continuing adverse water quality conditions in the reservoirs could also impair access to additional habitat. However, United States Department of the Interior (DOI) and United States Department of Commerce (DOC) prescriptions include elements to limit delays through reservoirs and fish ladders due to water quality issues. Implementation of fish passage at the dams under the Fish Passage at Four Dams Alternative would benefit anadromous fisheries in the Klamath River, thus resulting in long-term beneficial impacts on recreational fishing.

Removal of dams and reservoirs under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would result in gains in riparian habitat and wildlife corridors. The dams and reservoirs act as a barrier to terrestrial wildlife movement and migration. Elimination of the dams and reservoirs will remove these artificial barriers and allow for more natural gene-flow and population interactions.

Long-term beneficial impacts on environmental justice populations would occur under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative. The tribes' heavy reliance on social services and food subsidies is a direct result of long standing environmental injustices that have stripped tribal people of their ability to engage in

long-standing traditions and subsistence and commercial harvest activities. Increases in the populations of fall- and spring-run Chinook Salmon, coho salmon, and summer and winter steelhead would allow tribes to increase subsistence fishing and make fish a larger part of their diet and ceremonies. These effects would have long-term benefits on tribal health.

5.2.2 Klamath Basin Restoration Agreement

Implementation of some elements of the KBRA, including the Phase I Fisheries Restoration Plan, could result in short-term use of resources associated with standard construction activities. Implementation of KBRA actions would require short-term uses of capital, labor, fuels, and construction materials. Construction activities related to full implementation of the KBRA could result in short term greenhouse gas emissions. The Drought Plan and the Climate Change Assessment and Adaptive Management Plan under the KBRA would assess and address potential climate change impacts in the region. The plans will assist the region in planning and responding to the climate change impacts identified in the EIS/EIR. The following paragraphs describe the long-term increases in fisheries productivity that would result from KBRA actions.

The Phase I and Phase II Fisheries Restoration Plan under the KBRA would accelerate long-term improvements to fine sediment, water temperature, nutrients, and dissolved oxygen, thus increasing long-term productivity of the Klamath River Basin. Long-term productivity in the Klamath River Basin would also occur due to the continuation of the Williamson River Delta Project, the Agency Lake and Barnes Ranches Projects, the Wood River Wetland Restoration, the Water Use Retirement Program, and the Interim Flow and Lake Level Program. In addition to long-term benefits to water quality, the KBRA elements would expand the habitats available to fish and terrestrial species throughout the basin and would increase their viability and resilience.

In addition, KBRA implementation would result in the establishment of limitations on specific diversions for Reclamation's Klamath Project to protect flows on the mainstem and provide specific allocations of water from Klamath Reclamation Project diversions to the wildlife refuges. These actions would result in long-term benefits to water quality and habitats in the project area. The groundwater monitoring plan and pumping limits under the KBRA would also protect flows on the mainstem, thus providing stable habitat conditions to support the species of the basin. Additional aspects of the KBRA that would benefit aquatic resources include the Water Use Retirement Plan (WURP) and the Fish Entrainment Reduction actions.

The Fisheries Restoration Plan phases I and II would result in long-term benefits to fisheries populations and abundance, and terrestrial wildlife. Wetland habitats would benefit over the long term due to increased supplies of water delivered to wildlife refuges in the basin.

Plans and programs in the KBRA including Wood River Wetland Restoration, Future Storage Opportunities, Water Management on Reclamation's Klamath Project, and

WURP could result in long-term beneficial impacts on water supply and water rights. KBRA actions would improve water supply reliability and help ensure against impacts on water supply delivery. In addition, KBRA implementation would result in long-term benefits to surface water hydrology and flood protection related to new surface and groundwater storage options. The WURP is intended to permanently increase the flow of water into Upper Klamath Lake by 30,000 acre feet per year (KBRA Section 16.2.2), and could include actions to increase inflow (including upland vegetation management) that would result in beneficial impacts on groundwater resources. The Interim Flow and Lake Level Program (KBRA Section 20.4) would result in similar beneficial impacts on groundwater.

Under the Power for Water Management Program of the KBRA, irrigators participating in the program would be eligible for adjusted power rates, which would continue to allow area farmers to pump water at electricity rates that would maintain profitability of their operations. This effect would benefit farm workers as it would help farm operators stay in business. Implementation of the Power for Water Management Program could also involve the development of renewable energy sources, which would provide green energy. This would be a beneficial impact. In addition, several elements of the KBRA are intended to restore fisheries and improve water quality. These programs, combined with the Klamath County Economic Development Plan (KBRA Section 27.3) and the Tribal Programs Economic Revitalization (KBRA Section 31) could improve social services for county residents and tribal members. The Mazama Forest Project (KBRA Section 33.2) would result in the acquisition of 90,000 acres of timberland to be managed by the Klamath Tribes' Forest Management Plan, thus benefitting the Klamath Tribes.

KBRA programs including the Phase I Fisheries Restoration Plan, Fisheries Restoration Plan – Phase II, Williamson River Delta Project, Agency Lake and Barnes Ranches, Wood River Wetland Restoration, Flood Storage Opportunities, On-Project Plan, Water Use Retirement Plan, Fish Entrainment Reduction, and the Klamath Tribes Fishing Site would have long-term beneficial impacts.

5.2.3 Keno Transfer

The Proposed Action and the Partial Facilities Removal Alternative include the transfer of Keno Dam from PacifiCorp to the DOI. The Proposed Action and Description of Alternatives, Chapter 2, describes that PacifiCorp would transfer ownership and operational responsibility of the Keno Facility to the DOI. Operations under DOI would be consistent with the historic operations of the facility in place since the existing contract was signed on January 4, 1968; therefore, there would be no changes to operations or the surrounding areas as a result of the transfer. Future upgrades at the Keno facility by DOI would be subject to additional NEPA compliance.

Transfer of the Keno Facility may involve the use of vehicles and the commitment of vehicle fuel. The transfer would be undertaken as a connected action to dam removal because the facility would no longer be useful to PacifiCorp.

5.2.4 East and West Side Facilities

The Proposed Action and the Partial Facilities Removal Alternative include the decommissioning of PacifiCorp's East and West Side Facilities. In the event of an affirmative Secretarial Determination, under a plan outlined in the KHSA, PacifiCorp would apply to FERC for a partial surrender of its license of the East and West Side facilities in order to decommission the generating facilities (KHSA 6.4.1(A)). PacifiCorp would be responsible for the decommissioning and for recovering its costs through "standard ratemaking procedures" (KHSA 6.4.1(B)). Once the decommissioning was completed, the lands associated with the East and West Side facilities would be transferred to DOI.

Removing the two facilities would result in the loss of 3.8 megawatts of generating capacity and the removal of the generating infrastructure. Decommissioning may involve the use of vehicles and construction equipment. This would require short-term uses of capital, labor, fuels, and construction materials. Decommissioning of the facilities would be undertaken as a connected action to dam removal because the facility would no longer be useful to PacifiCorp.

5.3 Growth Inducing Impacts

CEQA Guidelines Section 15126.2(d) requires an environmental document to:

"Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth…."

NEPA requires that an EIS analyze direct and indirect impacts of growth-inducing effects. Growth-inducing effects under NEPA are a subset of indirect effects, which are defined as effects that "are caused by the action and occur later in time or are farther removed in distance, but are still reasonably foreseeable" (40 CFR 1508.8(b)). Direct growth-inducing impacts generally stem from the construction of new housing, businesses, or infrastructure. Indirect growth inducement could result if a project establishes substantial new permanent employment opportunities or if it would remove obstacles hindering population growth, such as the expansion or the provision of urban services and infrastructure in an undeveloped area. Under CEQA, growth inducement may not necessarily be considered detrimental, beneficial, or of insignificant consequence. Induced growth is considered a significant impact only if it directly (or indirectly) affects the ability of agencies to provide needed public services, or if it can be demonstrated that the potential growth significantly affects the environment.

The Proposed Action and alternatives would not result in the construction of new housing either directly or indirectly. The Proposed Action and alternatives would not provide new water, wastewater, sewer, electricity, or natural gas infrastructure or facilities and

would not require or create any new public services such as schools, public services, or public roads that could support increased growth in the Klamath Basin.

The Proposed Action and alternatives would require construction workers to perform the necessary construction work. Any employment required for the alternatives would be temporary and would be needed only during a 20-month period which includes an 8-month period of site preparation and partial drawdown at Copco 1 and a 12-month period for full drawdown and removal of facilities. Construction workers would likely commute to the sites from the surrounding local communities or find temporary accommodations for the duration of construction. Section 3.17, Population and Housing, analyzed all potential impacts from non-local workers as being less than significant as counties in the region have sufficient housing supply to accommodate the estimated number of non-local workers. Thus, there would be no need for the construction of new housing. Implementation of the Proposed Action or alternatives would not generate any permanent employment opportunities that would attract a substantial number of people to the region.

Restoration of the Klamath River fisheries is one of the main objectives of this project. If the fish populations were to rebound back to pre-dam levels, this could result in an increase in recreational fishing in the region, and possibly an increase in overall tourism. Such a change in visitor numbers would likely occur slowly as fish populations rebound, but would be unlikely to result in permanent population growth.

Neither the Proposed Action nor any of the alternatives would result in new housing, utilities, services, or permanent employment that could induce growth in the region, nor would the project result in any impacts that would require the provision of new housing, utilities, services, or permanent employment. The Proposed Action and alternatives would not induce growth.

5.4 Summary of Environmental Impacts

"A summary of the environmental impacts identified for each alternative (including beneficial effects) is presented in Table 5-1. Table 5-2 presents a subset of the impacts presented in Table 5.1 which, even after mitigation measures are implemented, may remain significant and unavoidable for the No Action/No Project and the action alternatives. The purpose of Table 5-1 and Table 5-2 is to consolidate and disclose the significance determinations made throughout the EIS/R and does not include particular information which are pursuant only to NEPA. Table 5-3 presents a summary of the environmental impacts of the resources analyzed in this EIS/EIR specific to NEPA for Tribal Trust, Socioeconomics, and Environmental Justice. While Table 5-4 presents a summary of the Wild and Scenic River (WSR) resource effects that will be utilized to complete a WSR assessment."

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.2 Water Quality				
Water Temperature				
Upper Klamath Basin				
Continued impoundment of water in the reservoirs could cause short-term and long-term seasonal water temperatures that are shifted from the natural thermal regime of the river and do not meet applicable Oregon DEQ and California Basin Plan water quality objectives and adversely affect beneficial uses in the Hydroelectric Reach.	1, 4,5	NCFEC	None	NCFEC
Dam removal and/or elimination of hydropower peaking operations at J.C. Boyle Powerhouse could cause short-term and long-term alterations in daily water temperatures and fluctuations in the J.C. Boyle bypass and peaking reaches.	2, 3, 5	S for J.C. Boyle bypass reach B for J.C. Boyle peaking reach	None	S for J.C. Boyle bypass reach B for J.C. Boyle peaking reach
Dam removal and conversion of the reservoir areas to a free-flowing river could cause short-term and long-term increases in spring time water temperatures and decreases in late summer/fall water temperatures in the Hydroelectric Reach downstream of Copco 1 Reservoir.	2, 3, 5	S for springtime B for late summer/fall	None	S for springtime B for late summer/fall
Lower Klamath Basin				
Draining the reservoirs and release of sediment could cause short-term and long-term increases in sediment deposition in the Klamath River or Estuary that could alter morphological characteristics and indirectly affect seasonal water temperatures.	2, 3, 5	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Continued impoundment of water in the reservoirs could cause short-term and long-term seasonal water temperatures that are shifted from the natural thermal regime of the river and do not meet applicable California North Coast Basin Plan water quality objectives and adversely affect beneficial uses in the Klamath River downstream of Iron Gate Dam.	1, 4	NCFEC	None	NCFEC
Dam removal and conversion of the reservoir areas to a free flowing river could result in short-term and long-term increases in spring water temperatures and decreases in late summer/fall water temperatures in the Lower Klamath River.	2, 3, 5	S – Iron Gate Dam to Salmon River for springtime	None	S – Iron Gate Dam to Salmon River for springtime
Suspended Sediments				
Upper Klamath Basin				
Continued impoundment of water in the reservoirs could result in short-term and long-term interception and retention of mineral (inorganic) suspended material by the KHP dams.	1, 4	NCFEC	None	NCFEC
Implementation of IM 7, J.C. Boyle Gravel Placement and/or Habitat Enhancement, could result in short-term increases in mineral (inorganic) suspended material in the Hydroelectric Reach.	1 ,2 ,3	LTS	None	LTS
Implementation of IM 8, J.C. Boyle Bypass Barrier Removal, could result in short-term increases in mineral suspended material in the Hydroelectric Reach due to deconstruction activities.	1	LTS	None	LTS
Implementation of IM 16, Water Diversions, could result in short-term increases in mineral (inorganic) suspended material in the Hydroelectric Reach due to diversion screening deconstruction and construction activities.	2 ,3	LTS	None	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Continued impoundment of water in the reservoirs could cause short- term and long-term seasonal (April through October) increases in algal-derived (organic) suspended material in the Hydroelectric Reach due to in-reservoir algal blooms.	1, 4	NCFEC	None	NCFEC
Draining the reservoirs and release of sediment could cause short-term increases in suspended material in the Hydroelectric Reach downstream of J.C. Boyle Dam.	2, 3, 5	S	None	S
Construction/deconstruction activities could cause short-term increases in suspended material in the Hydroelectric Reach due to stormwater runoff from construction/deconstruction areas.	2, 3, 4, 5	LTS	None	LTS
Removal of Iron Gate Dam would require relocation of the Yreka Water Supply Pipeline which could cause short-term increases in suspended material in the Hydroelectric Reach during the construction period.	2, 3, 5	LTS	None	LTS
Construction/deconstruction activities would include the demolition of various recreation facilities which could cause short-term increases in suspended material in the Hydroelectric Reach from stormwater runoff from the demolition areas.	2, 3, 5	LTS	None	LTS
Revegetation associated with management of the reservoir footprint area after dam removal could decrease the short-term erosion of fine sediments from exposed reservoir terraces in the Hydroelectric Reach.	2, 3, 5	B	None	B
Dam removal could eliminate the interception and retention of mineral (inorganic) suspended material behind the dams and result in long-term increases in suspended material in the Hydroelectric Reach.	2, 3, 5	LTS	None	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Dam removal could eliminate the interception and retention of algal-derived (organic) suspended material behind the dams and result in long-term increases in suspended material in the Hydroelectric Reach.	2, 3, 5	LTS	None	LTS
Lower Klamath Basin				
Draining the reservoirs and release of sediment could cause short-term increases in suspended material in the lower Klamath River and the Klamath Estuary.	2, 3	S	None	S
Draining the reservoirs and release of sediment could cause short-term increases in sediment loads from the Klamath River to the Pacific Ocean and corresponding increases in concentrations of suspended material and rates of deposition in the marine nearshore environment.	2, 3, 5	LTS	None	LTS
Continued impoundment of water in the reservoirs could cause short-term and long-term interception and retention of mineral (inorganic) sediments by the dams and correspondingly low levels of suspended material immediately downstream of Iron Gate Dam.	1, 4	NCFEC	None	NCFEC
Continued impoundment of water in the reservoirs could result in short-term and long-term seasonal (April through October) increases in algal-derived (organic) suspended material in the KHP reservoirs and subsequent transport into the Klamath River downstream of Iron Gate Dam.	1, 4	NCFEC	None	NCFEC
Construction/deconstruction activities could cause short-term increases in suspended material in the lower Klamath River, Klamath Estuary, and marine nearshore environment due to stormwater runoff from construction/deconstruction areas.	2, 3, 5	LTS	None	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Revegetation associated with management of the reservoir footprint area after dam removal could decrease the short-term erosion of fine sediments from exposed reservoir terraces into the lower Klamath River and Klamath Estuary.	2, 3, 5	B	None	B
Dam removal could eliminate the interception and retention of mineral (inorganic) suspended material behind the dams and result in long-term increases in suspended material in the lower Klamath River, the Klamath Estuary, and the marine nearshore environment.	2, 3, 5	LTS	None	LTS
Dam removal could eliminate the interception and retention of algal-derived (organic) suspended material behind the dams and result in long-term increases in suspended material in the lower Klamath River, the Klamath Estuary, and the marine nearshore environment.	2, 3, 5	LTS	None	LTS
Nutrients				
Upper Klamath Basin				
Continued impoundment of water in the reservoirs could result in long-term interception and retention of TP and TN in the Hydroelectric Reach on an annual basis but release (export) of TP and TN from reservoir sediments on a seasonal basis.	1, 4	NCFEC	None	NCFEC
Draining the reservoirs and release of sediment could cause short-term increases in sediment- associated nutrients in the Hydroelectric Reach.	2, 3, 5	LTS	None	LTS
Dam removal and conversion of the reservoir areas to a free-flowing river could cause long-term increases in nutrient levels in the Hydroelectric Reach.	2, 3, 5	LTS	None	LTS
Lower Klamath Basin				
Continued impoundment of water in the reservoirs could cause long-term interception and retention of TP and TN on an annual basis but release (export) of TP and TN on a seasonal basis.	1, 4	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Draining the reservoirs and release of sediment to the lower Klamath River could cause short-term increases in sediment-associated nutrients in the river and the Klamath Estuary.	2, 3, 5	LTS	None	LTS
Dam removal and conversion of the reservoir areas to a free-flowing river could cause long-term increases in nutrient levels in the lower Klamath River, the Klamath Estuary, and the marine nearshore environment.	2, 3, 5	LTS	None	LTS
Dissolved Oxygen				
Upper Klamath Basin				
Continued impoundment of water in the reservoirs could cause long-term[1] seasonal and daily variability in dissolved oxygen concentrations in the Hydroelectric Reach, such that levels do not meet Oregon DEQ and California North Coast Basin Plan water quality objectives and adversely affect beneficial uses.	1, 4	NCFEC	None	NCFEC
Draining the reservoirs and release of sediment could cause short-term[2] increases in oxygen demand (Immediate Oxygen Demand [IOD] and Biological Oxygen Demand [BOD]) and reductions in dissolved oxygen in the Hydroelectric Reach downstream of J.C. Boyle Reservoir.	2, 3, 5	S	None	S
Dam removal and conversion of reservoir areas to free-flowing river conditions could cause long-term increases in dissolved oxygen, as well as increased daily variability in dissolved oxygen, in the Hydroelectric Reach.	2, 3, 5	B	None	B

[1] Long-term is defined as 2-50 years.
[2] Short-term is defined as <2 years.

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Lower Klamath Basin				
Continued impoundment of water in the reservoirs could cause long-term seasonal and daily variability in dissolved oxygen concentrations in the Klamath River downstream of Iron Gate Dam, such that levels do not meet California North Coast Basin Plan and Hoopa Valley Tribe water quality objectives and adversely affect beneficial uses.	1, 4	NCFEC	None	NCFEC
Dam removal and sediment release could cause short-term increases in oxygen demand (Immediate Oxygen Demand [IOD] and Biological Oxygen Demand [BOD]) and reductions in dissolved oxygen in the lower Klamath River, the Klamath Estuary, and the marine nearshore environment.	2, 3, 5	S (lower Klamath River from Iron Gate Dam to Clear Creek) NCFEC (Klamath Estuary or Marine Nearshore Environment)	None	S (lower Klamath River from Iron Gate Dam to Clear Creek) NCFEC (Klamath Estuary or Marine Nearshore Environment)
Dam removal and conversion of reservoir areas to a free-flowing river could cause long-term increases in dissolved oxygen, as well as increased daily variability in dissolved oxygen, in the lower Klamath River, particularly for the reach immediately downstream of Iron Gate Dam.	2, 3, 5	B	None	B
pH				
Upper Klamath Basin				
Continued impoundment of water in the reservoirs could cause long-term elevated seasonal pH and daily variability in pH in the Hydroelectric Reach.	1, 4	NCFEC	None	NCFEC
Dam removal and conversion of the reservoir areas to a free-flowing river could cause short-term and long-term decreases in summertime pH in the Hydroelectric Reach.	2, 3, 5	B	None	B
Lower Klamath Basin				
Continued impoundment of water in the reservoirs could cause long-term elevated seasonal pH and daily variability in pH in the lower Klamath River downstream of Iron Gate Dam.	1, 4	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Dam removal and conversion of the reservoir areas to a free-flowing river could cause short-term and long-term decreases in summertime pH in the lower Klamath River, Klamath Estuary, and the marine nearshore environment.	2, 3, 5	B	None	B
Dam removal and conversion of the reservoir areas to a free-flowing river could cause long-term summertime increases in pH in the lower Klamath River downstream of Iron Gate Dam.	2, 3, 5	LTS (from Iron Gate Dam to confluence with the Scott River) NCFEC (Klamath River just downstream of Seiad Valley, the Klamath Estuary, and the Marine Nearshore Environment)	None	LTS (from Iron Gate Dam to confluence with the Scott River) NCFEC (Klamath River just downstream of Seiad Valley, the Klamath Estuary, and the Marine Nearshore Environment)
Chlorophyll-a and Algal Toxins				
Upper Klamath Basin				
Continued impoundment of water in the reservoirs could support long-term growth conditions for toxin-producing nuisance algal species such as *M. aeruginosa*, resulting in high seasonal concentrations of chlorophyll-a and algal toxins in the Hydroelectric Reach.	1, 4	NCFEC	None	NCFEC
Dam removal and conversion of the reservoir areas to a free-flowing river would cause short-term and long-term decreases in levels of chlorophyll-a and algal toxins in the Hydroelectric Reach.	2, 3, 5	B	None	B

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Lower Klamath Basin				
Continued impoundment of water in the reservoirs could support long-term growth conditions for toxin-producing nuisance algal species such as *M. aeruginosa*, resulting in high seasonal concentrations of chlorophyll-a and algal toxins transported into the Klamath River from downstream of Iron Gate Dam to the Klamath Estuary, and potentially to the marine nearshore environment.	1, 4	NCFEC	None	NCFEC
Dam removal and conversion of the reservoir areas to a free-flowing river would cause short-term and long-term decreases in levels of chlorophyll-a and algal toxins in the lower Klamath River and the Klamath Estuary.	2, 3, 5	B	None	B
Inorganic and Organic Contaminants				
Upper Klamath Basin				
Continued impoundment of water in the reservoirs and associated interception and retention of sediments behind the dams could cause long-term low-level exposure to inorganic and organic contaminants for freshwater aquatic species in the Hydroelectric Reach.	1, 4, 5	NCFEC	None	NCFEC
Continued impoundment of water in the reservoirs and associated interception and retention of sediments behind the dams could cause long-term low-level exposure to inorganic and organic contaminants in the Hydroelectric Reach through human consumption of resident fish tissue.	1, 4, 5	NCFEC	None	NCFEC
Draining the reservoirs and sediment release could cause short-term increases in concentrations of inorganic and organic contaminants and result in low-level exposure for freshwater aquatic species in the Hydroelectric Reach.	2, 3, 5	LTS	None	LTS
Draining the reservoirs and sediment release could cause short-term human exposure to contaminants from contact with deposited sediments on exposed reservoir terraces and river banks within the Hydroelectric Reach.	2, 3, 5	LTS	None	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Construction/deconstruction activities could cause short-term increases in inorganic and organic contaminants from hazardous materials associated with construction and revegetation equipment in the Hydroelectric Reach.	2, 3, 5	LTS	None	LTS
Reservoir area restoration activities could include herbicide application which could cause short-term levels of organic contaminants in runoff that are toxic to aquatic biota in the Hydroelectric Reach.	2, 3, 5	LTS	None	LTS
Lower Klamath Basin				
Dam removal and sediment release could cause short-term and long-term increases in concentrations of inorganic and organic contaminants and result in low-level exposure for freshwater aquatic species in the lower Klamath River and the Klamath Estuary.	2, 3, 5	LTS	None	LTS
Draining the reservoirs and sediment release could cause short-term human exposure to contaminants from contact with deposited sediments on exposed downstream river terraces and downstream river banks following reservoir drawdown.	2, 3, 5	LTS	None	LTS
Construction/deconstruction activities could cause short-term increases in suspended sediments and the potential for inorganic and organic contaminants from hazardous materials associated with construction equipment to be transported into the lower Klamath River, Klamath Estuary, and the marine nearshore environment.	2, 3, 4, 5	LTS	None	LTS
Trap and Haul Operations				
Implementation of the trap and haul element of the Fisheries Reintroduction and Management Plan could affect water quality during construction.	4, 5	LTS	None	LTS
Keno Transfer				
Implementation of the Keno Transfer could cause adverse water quality effects.	2, 3	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
East and West Side Facilities				
Decommissioning the East and West Side Facilities could cause adverse water quality effects.	2, 3	NCFEC	None	NCFEC
KBRA				
Implementation of the Phase I Fisheries Restoration Plan could result in short-term construction-related increases in suspended materials and long-term reductions in fine sediment inputs, reduced summer water temperatures, improved nutrient interception, and increased dissolved oxygen levels. .	2, 3	LTS (short-term) B (long-term)	None	LTS (short-term) B (long-term)
Implementation of the Phase II Fisheries Restoration Plan under the KBRA (KBRA Section 10.2) would include a continuation of the same types of resource management actions as under Phase I along with provisions for adaptive management of these actions and would therefore have the same short-term (i.e., during construction activities) and long-term impacts as Phase I.	2, 3	LTS (short-term) B (long-term)	None	LTS (short-term) B (long-term)
Implementation of the trap and haul element of the Fisheries Reintroduction and Management Plan could affect water quality during construction.	2, 3,	LTS	None	LTS
Implementation of Wood River Wetland Restoration could result in short-term construction-related increases in suspended materials and long-term warmer spring water temperatures and reduced fine sediment and nutrient inputs to Upper Klamath Lake.	2, 3	LTS (short-term) B (long-term)	None	LTS (short-term) B (long-term)
Implementation of Water Diversion Limitations could result in decreased summer water temperatures in the Klamath River upstream of the Hydroelectric Reach.	2, 3	NCFEC (short-term) B (long-term)	None	NCFEC (short-term) B (long-term)
Implementation of the Water Use Retirement Program could result in decreases in summer water temperature and nutrient inputs to Upper Klamath Lake.	2, 3	NCFEC (short-term) B (long-term)	None	NCFEC (short-term) B (long-term)

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Implementation of the Interim Flow and Lake Level Program could result in decreases in summer water temperature and nutrient inputs to Upper Klamath Lake.	2, 3	NCFEC (short-term) B (long-term)	None	NCFEC (short-term) B (long-term)
3.3 Aquatic Resources				
Critical Habitat				
Continued impoundment of water within the reservoirs could alter the water quality and habitat suitability within critical habitat.	1,4	NCFEC (coho) NCFEC (Bull Trout and Southern Resident Killer Whale)	None	NCFEC (coho) NCFEC (Bull Trout, Southern Resident Killer Whale)
Reservoir drawdown associated with dam removal could alter the quality of critical habitat.	2, 3, 5	S (short-term for coho) LTS (Bull Trout and Southern Resident Killer Whale)	None	S (short-term for coho) LTS (Bull Trout and Southern Resident Killer Whale)
The removal of dams and reservoirs could alter the availability and quality of critical habitat.	2,3,5	B (coho) LTS (Bull Trout and Southern Resident Killer Whale)	None	B (coho) LTS (Bull Trout, Southern Resident Killer Whale)
Essential Fish Habitat				
Continued impoundment of water within the reservoirs could alter the availability and suitability of Essential Fish Habitat (EFH).	1, 4	NCFEC (Chinook and coho salmon EFH) NCFEC (Groundfish EFH, Pelagic Fish)	None	NCFEC (Chinook and coho salmon EFH) NCFEC (Groundfish EFH, Pelagic Fish)
Reservoir drawdown associated with dam removal could alter the quality of EFH.	2, 3, 5	S (short-term for Chinook and coho) LTS (groundfish and pelagic fish)	None	S (short-term for Chinook and coho) LTS (groundfish and pelagic fish)
The removal of dams and reservoirs could alter the availability and quality of EFH.	2, 3, 5	B (Chinook and coho) LTS (groundfish and pelagic fish)	None	B (Chinook and coho) LTS (groundfish and pelagic fish)

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Species Impacts				
Fall-run Chinook Salmon				
Continued impoundment of water within the reservoirs alter habitat suitability affecting Fall-run Chinook salmon.	1	NCFEC	None	NCFEC
Continued blockage of habitat access at the Four Facilities could alter habitat availability affecting Fall-Run Chinook salmon.	1	NCFEC	None	NCFEC
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect Fall-run Chinook salmon.	2, 3, 5	S	AR-1: Protection of mainstem spawning; AR-2: Protection of outmigrating juveniles; AR-3: Fall flow pulses; AR-4: Hatchery management	LTS
Removal of Project dams could result in alterations in habitat availability, flow regime, water quality, temperature variation, and fish disease incidence, and algal toxins which could affect Fall-run Chinook salmon.	2, 3, 5	B	None	B
Fish passage provisions could result in alterations in habitat availability which could affect Fall-run Chinook salmon.	4	B	None	B
Spring-run Chinook Salmon				
Continued impoundment of water within the reservoirs could alter habitat suitability affecting Spring-run Chinook salmon.	1	NCFEC	None	NCFEC
Continued blockage of habitat access at the Four Facilities could alter habitat availability affecting Spring-run Chinook salmon.	1	NCFEC	None	NCFEC
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect spring-run Chinook salmon.	2, 3, 5	LTS	AR-2: Protection of outmigrating juveniles	LTS
Removal of Project dams could result in alterations in habitat availability, flow regime, water quality, temperature variation, and fish disease incidence, and algal toxins which could affect Spring-run Chinook salmon.	2, 3, 5	B	None	B

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Fish passage provisions could result in alterations in habitat availability which could affect Spring-run Chinook salmon.	4	B	None	B
Coho Salmon				
Continued impoundment of water within reservoirs at the Four Facilities could alter habitat suitability affecting coho salmon.	1	NCFEC (for all population units)	None	NCFEC (for all population units)
Continued blockage of habitat access at the Four Facilities could alter habitat availability affecting coho salmon.	1	NCFEC (for all population units)	None	NCFEC (for all population units)
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect coho salmon.	2, 3, 5	S (Upper Klamath River, Mid-Klamath River, Shasta River, and Scott River population units) LTS (Trinity River, Salmon River, and Lower Klamath River population units)	AR-1: Protection of mainstem spawning; AR-2: Protection of outmigrating juveniles; AR-3: Fall flow pulses; AR-4: Hatchery management	S (Upper Klamath River, Mid-Klamath River, Shasta River, and Scott River population units) LTS (Trinity River, Salmon River, and Lower Klamath River population units)
Removal of Project dams could result in alterations in habitat availability, flow regime, water quality, temperature variation, and fish disease incidence, and algal toxins which could affect coho salmon.	2, 3, 5	B (Upper Klamath River, Mid-Klamath River, Shasta River, Scott River, Salmon River, and Lower Klamath River population units) LTS (Trinity River population units)	None	B (Upper Klamath River, Mid-Klamath River, Shasta River, Scott River, Salmon River, and Lower Klamath River population units) LTS (Trinity River population units)

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Fish passage provisions could result in alterations in habitat availability which could affect coho salmon.	4	B (Upper Klamath River population unit) NCFEC (Mid-Klamath River, Shasta River, Scott River, Salmon River, Trinity River, and Lower Klamath River population units)	None	B (Upper Klamath River population unit) NCFEC (Mid-Klamath River, Shasta River, Scott River, Salmon River, Trinity River, and Lower Klamath River population units)
Steelhead				
Continued impoundment of water within the reservoirs could alter habitat suitability affecting steelhead.	1	NCFEC	None	NCFEC
Continued blockage of habitat access at the Four Facilities could alter habitat availability affecting steelhead.	1	NCFEC	None	NCFEC
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect steelhead in the short-term.	2, 3, 5	S	AR-1: Protection of mainstem spawning; AR-2: Protection of outmigrating juveniles; AR-3: Fall flow pulses; AR-4: Hatchery management	S
Removal of Project dams could result in alterations in habitat availability, flow regime, water quality, temperature variation, and fish disease incidence, and algal toxins which could affect steelhead.	2, 3, 5	B	None	B
Fish passage provisions could result in alterations in habitat availability which could affect steelhead.	4	B	None	B
Pacific Lamprey				
Continued impoundment of water within the reservoirs could alter habitat suitability affecting Pacific lamprey.	1	NCFEC	None	NCFEC
Reservoir drawdown associated with dam removal could alter SSCs, bedload sediment transport, and deposition which could affect Pacific lamprey in the short-term.	2, 3, 5	S	AR-2: Protection of outmigrating juveniles; AR-5: Pacific lamprey capture and relocation	S

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Removal of Project dams could result in alterations in habitat availability, flow regime, water quality, and temperature variation, which could affect Pacific lamprey.	2, 3, 5	B	None	B
Fish passage provisions could result in alterations in habitat availability which could affect Pacific lamprey.	4	B	None	B
Green Sturgeon				
Continued impoundment of water within the reservoirs could alter habitat suitability affecting green sturgeon.	1	NCFEC	None	NCFEC
Continued blockage of habitat access at the Four Facilities could alter habitat availability affecting green sturgeon.	1	NCFEC	None	NCFEC
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect green sturgeon.	2, 3, 5	S	AR-3: Fall flow pulses	S
Removal of dams could result in alterations in habitat availability, flow regime, water quality, temperature variation, fish disease incidence, and algal toxins which could affect green sturgeon.	2, 3, 5	LTS	None	LTS
Fish passage provisions could result in alterations in habitat availability which could affect green sturgeon.	4	NCFEC	None	NCFEC
Shortnose Sucker and Lost River				
Continued impoundment of water within the reservoirs could alter habitat suitability affecting Lost River and shortnose suckers.	1	NCFEC	None	NCFEC
	4	LTS	None	LTS
Continued blockage of habitat access at the Four Facilities could alter habitat availability affecting Lost River and shortnose suckers.	1	NCFEC	None	NCFEC
Reservoir removal associated with dam removal could alter habitat availability and affect Lost River and shortnose suckers	2, 3, 5	S	AR-6: Sucker rescue and relocation	LTS
Restoration action associated with KBRA implementation could alter habitat availability and suitability and affect Lost River and shortnose suckers.	2	B	None	B

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Fish passage provisions could affect shortnose and Lost River Sucker populations by continuing poor water quality and high rates of predation.	4, 5	LTS	None	LTS
Redband Trout				
Continued impoundment of water within the reservoirs could alter habitat suitability affecting redband trout.	1,5	NCFEC	None	NCFEC
Continued blockage of habitat access at the Four Facilities could alter habitat availability affecting redband trout.	1	NCFEC	None	NCFEC
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect redband trout.	2, 3, 5	LTS	None	LTS
Removal of dams could result in alterations in habitat availability, flow regime, water quality, temperature variation, which could affect redband trout.	2, 3, 5	B	None	B
Fish passage provisions could result in alterations in habitat availability which could affect redband trout.	4	B	None	B
Bull Trout				
Continued impoundment of water within the reservoirs and blockage of habitat could alter habitat suitability affecting bull trout.	1	NCFEC	None	NCFEC
Dam removal and/or fish passage could alter habitat access for anadromous fish, which could affect bull trout.	2, 3, 4, 5	LTS	None	LTS
Eulachon				
Continued impoundment of water within the reservoirs and blockage of habitat could alter habitat suitability affecting eulachon.	1, 4	NCFEC	None	NCFEC
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect eulachon.	2, 3, 5	LTS	None	LTS
Longfin Smelt				
Continued impoundment of water within the reservoirs and blockage of habitat could alter habitat suitability affecting longfin smelt.	1, 4	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect longfin smelt.	2, 3, 5	LTS	None	LTS
Introduced Resident Species				
Continued impoundment of water within the reservoirs could alter habitat suitability affecting introduced resident species.	1, 4	NCFEC	None	NCFEC
Continued blockage of habitat access at the Four Facilities could alter habitat availability affecting introduced resident species.	1	NCFEC	None	NCFEC
Fish passage provisions could result in alterations in habitat availability which could affect introduced resident species.	4	NCFEC	None	NCFEC
Mandatory conditions and provisions for continued hydroelectric operations could alter habitat suitability affecting introduced resident species.	4	LTS	None	LTS
Freshwater mussels				
Continued impoundment of water within the reservoirs and blockage of habitat could alter habitat suitability affecting freshwater mussels.	1	NCFEC	None	NCFEC
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect freshwater mussels in the short-term.	2, 3, 5	S	AR-7: Freshwater mussel relocation	S
Removal of dams could result in alterations in habitat availability, flow regime, water quality, and temperature variation, which could affect freshwater mussels in the long-term.	2, 3, 5	B	None	B
Dam removal would increase connectivity between Upper Klamath Basin and the Hydroelectric Reach and would create additional riverine habitat within the Hydroelectric Reach.	2, 3, 5	B	None	B
Fish passage provisions could result in alterations in habitat availability which could affect freshwater mussels.	4	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Benthic Macroinvertebrates				
Continued impoundment of water within the reservoirs and blockage of habitat could alter habitat suitability affecting macroinvertebrates.	1	NCFEC	None	NCFEC
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect macroinvertebrates.	2, 3, 5	S	None	S
Removal of dams could result in alterations in habitat availability, flow regime, water quality, and temperature variation, which could affect macroinvertebrates.	2, 3, 5	B	None	B
Fish passage provisions could result in alterations in habitat availability which could affect macroinvertebrates.	4	NCFEC	None	NCFEC
Interim Measures				
IM 7, implementation of J.C. Boyle Gravel Placement and/or Habitat Enhancement could result in alterations to habitat quality and affect aquatic species.	1,2,3	B – Fall-run Chinook, spring-run Chinook, steelhead, Pacific lamprey, redband trout, and benthic macroinvertebrates. Coho Salmon (Upper Klamath River population units) LTS – all other Coho population units NCFEC – green sturgeon, eulachon, southern Resident Killer Whales	None	B – Fall-run Chinook, spring-run Chinook, steelhead, Pacific lamprey, redband trout, and benthic macroinvertebrates. Coho Salmon (Upper Klamath River population units. LTS – all other Coho population units NCFEC – green sturgeon, eulachon, Southern Resident Killer Whales

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
IM 8, implementation of J.C. Boyle Bypass Barrier removal could result in alterations to habitat availability, and affect aquatic species.	1, 2	B-Fall-run Chinook, spring-run Chinook, steelhead, Pacific lamprey, and redband trout. Coho Salmon (Upper Klamath River population units) LTS – all other Coho population units NCFEC – macroinvertebrates, freshwater muscles, green sturgeon, eulachon, southern Resident Killer Whales	None	B-Fall-run Chinook, spring-run Chinook, steelhead, Pacific lamprey, and redband trout. Coho Salmon (Upper Klamath River population units) LTS – all other Coho population units NCFEC – macroinvertebrates, freshwater muscles, green sturgeon, eulachon, southern Resident Killer Whales
IM 16, implementation of the interim measure Water Diversions could result in alterations to habitat availability and habitat quality and affect aquatic species.	3	B-Fall-run Chinook, spring-run Chinook, steelhead, Pacific lamprey, and redband trout. Coho Salmon (Upper Klamath River population units) LTS – all other Coho population units, bull trout, freshwater mussels, shortnose and Lost River suckers NCFEC – green sturgeon, eulachon, southern Resident Killer Whales	None	B-Fall-run Chinook, spring-run Chinook, steelhead, Pacific lamprey, and redband trout. Coho Salmon (Upper Klamath River population units) LTS – all other Coho population units, bull trout, freshwater mussels, shortnose and Lost River suckers NCFEC – green sturgeon, eulachon, southern Resident Killer Whales

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Trap and Haul Operations				
Implementation of trap and haul measures could affect aquatic species.	4, 5	B (fall-run Chinook)	None	B (fall-run Chinook)
Construction-Related Impacts				
The removal of dams and reservoirs and the construction of fish passage facilities could disturb the river channel during construction which could affect aquatic species.	2, 3, 4, 5	LTS	None	LTS
Removal of the dams will require the new construction to relocate of the City of Yreka water supply pipeline. Relocation of the City of Yreka water supply pipeline could disturb the river channel during construction and affect aquatic resources.	2, 3, 5	LTS	None	LTS
Keno Transfer				
Implementation of the Keno Transfer could cause adverse aquatic resource effects.	2, 3	NCFEC	None	NCFEC
East and West Side Facilities				
Decommissioning the East and West Side Facilities could cause adverse aquatic resource effects.	2, 3	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
KBRA				
Implementation of Phases I and 2 Fisheries Restoration Plans and Fisheries Monitoring Plan could result in alterations to water quantity, water quality, habitat availability and habitat quality, and affect aquatic species.	2, 3	B (fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, redband trout, benthic macroinvertebrates, and shortnose and Lost River suckers, coho salmon except for the Trinity River Populations); NCFEC (green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, and freshwater mussels); LTS (coho Trinity River)	None	B (fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, redband trout, benthic macroinvertebrates, and shortnose and Lost River suckers, coho salmon except for the Trinity River Populations); NCFEC (green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, and freshwater mussels); LTS (coho Trinity River)

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Implementation of Phase I of the Fisheries Reintroduction and Management Plan could result in alterations to habitat availability (fish access), and could affect aquatic species.	2, 3	B (fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, Southern Resident Killer Whales, benthic macroinvertebrates, coho except those Trinity River population units); NCFEC (coho Trinity River Population Units; green sturgeon, bull trout, eulachon, and freshwater mussels); LTS (redband trout, shortnose and Lost River suckers)	None	B (fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, Southern Resident Killer Whales, benthic macroinvertebrates, coho except those Trinity River population units); NCFEC (coho Trinity River Population Units; green sturgeon, bull trout, eulachon, and freshwater mussels); LTS (redband trout, shortnose and Lost River suckers)

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Implementation of Water Diversion Limitations could result in reducing uncertainties associated with maintaining adequate ecological flows for aquatic species and their habitats, especially in low-flow years, and could alter water quality, and water temperatures in certain seasons and affect aquatic species.	2, 3	B (fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, redband trout, shortnose and Lost River suckers, coho except those Trinity River population units); NCFEC (coho Trinity River Population Units; green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, freshwater mussels, and benthic macroinvertebrates)	None	B (fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, redband trout, shortnose and Lost River suckers, coho except those Trinity River population units); NCFEC (coho Trinity River Population Units; green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, freshwater mussels, and benthic macroinvertebrates)

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Implementation of On-Project Plan could result in alterations to water quantity and water quality and affect aquatic species.	2, 3	B (fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, redband trout, shortnose and Lost River suckers, coho except those Trinity River population units); NCFEC (coho Trinity River Population Units; green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, freshwater mussels, and benthic macroinvertebrates)	None	B (fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, redband trout, shortnose and Lost River suckers, coho except those Trinity River population units); NCFEC (coho Trinity River Population Units; green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, freshwater mussels, and benthic macroinvertebrates)

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
The Water Use Retirement Program could alter water quantity and water quality, and affect aquatic species.	2, 3	B (fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, redband trout, shortnose and Lost River suckers, coho except those Trinity River population units); NCFEC (coho Trinity River Population Units; green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, freshwater mussels, and benthic macroinvertebrates)	None	B (fall-run Chinook salmon, spring-run Chinook salmon, steelhead, Pacific lamprey, redband trout, shortnose and Lost River suckers, coho except those Trinity River population units); NCFEC (coho Trinity River Population Units; green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, freshwater mussels, and benthic macroinvertebrates)

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Implementation of the Fish Entrainment Reduction could result in alterations to potential alterations to mortality risk and affect aquatic species.	2, 3	B (shortnose and Lost River suckers, redband trout, fall-run Chinook salmon, spring-run Chinook salmon, steelhead, and Pacific lamprey, coho salmon from the Upper Klamath River population unit); NCFEC (all other coho salmon population units, green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, freshwater mussels, and benthic macroinvertebrates)	None	B (shortnose and Lost River suckers, redband trout, fall-run Chinook salmon, spring-run Chinook salmon, steelhead, and Pacific lamprey, coho salmon from the Upper Klamath River population unit); NCFEC (all other coho salmon population units, green sturgeon, bull trout, eulachon, Southern Resident Killer Whales, freshwater mussels, and benthic macroinvertebrates)
Implementation of the Klamath River Tribes Interim Fishing Site could result in alterations to managed harvest mortality of fish species that are culturally important to the Klamath River Tribes,	2, 3	NCFEC	None	NCFEC
Implementation of the Interim Flow and Lake Level Program could result in decreases in summer water temperature and nutrient inputs to Upper Klamath Lake.	2, 3	B	None	B
3.4 Algae				
Upper Klamath Basin Upstream of the Influence of J.C. Boyle Reservoir				
Dam removal activities could decrease the spatial extent, temporal duration, toxicity, or concentration of nuisance and/or noxious phytoplankton in the area of analysis.	2, 3, 5	NCFEC	None	NCFEC
Dam removal activities could decrease the spatial extent, temporal duration, or biomass of nuisance periphyton in the area of analysis	2, 3, 5	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Hydroelectric Reach				
Continued impoundment of water in the reservoirs could support long-term growth of nuisance and/or noxious phytoplankton such as M. aeruginosa in the Hydroelectric Reach.	1, 4	NCFEC	None	NCFEC
Removal of the reservoirs would eliminate lacustrine habitat behind the dams and could decrease the long-term spatial extent, temporal duration, or concentration of nuisance and/or noxious phytoplankton blooms in the Hydroelectric Reach.	2, 3, 5	B	None	B
Dam removal and the elimination of hydropower peaking operations could result in long-term increased biomass of nuisance periphyton in low-gradient channel margin areas within the Hydroelectric Reach.	2, 3	S	None	S
	5	LTS	None	LTS
Removal of Iron Gate Dam would require relocation of the Yreka Water Supply Pipeline which could impact algae.	2, 3, 5	NCFEC	None	NCFEC
Construction and deconstruction activities would include the demolition of various recreation facilities that could affect algae.	2, 3, 5	NCFEC	None	NCFEC
Klamath River Downstream of Iron Gate Dam				
Continued impoundment of water in the reservoirs could support long-term growth of nuisance and/or noxious phytoplankton such as M. aeruginosa in the Hydroelectric Reach and subsequent transport into the Klamath River downstream of Iron Gate Dam.	1, 4	NCFEC	None	NCFEC
Continued impoundment of water at the Four Facilities could support long-term growth of nuisance periphyton such as Cladophora spp. Downstream of Iron Gate Dam.	1, 4	NCFEC	None	NCFEC
Removal of the reservoirs would eliminate lacustrine habitat behind the dams could substantially reduce or eliminate the transport of nuisance and/or noxious phytoplankton blooms and concentrations of algal toxins into the Klamath River downstream of Iron Gate Dam.	2, 3, 5	B	None	B

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Dam removal and conversion of the reservoir areas to a free-flowing river could cause long-term increases in nutrient levels and periphyton biomass in the Klamath River downstream of Iron Gate Dam.	2, 3, 5	LTS	None	LST
Klamath Estuary				
Continued impoundment of water in the reservoirs could support long-term growth of nuisance and/or noxious phytoplankton such as M. aeruginosa in the Hydroelectric Reach and subsequent transport into the Klamath Estuary.	1, 4	NCFEC	None	NCFEC
Removal of the reservoirs would eliminate lacustrine habitat behind the dams could substantially reduce or eliminate the transport of nuisance and/or noxious phytoplankton blooms and concentrations of algal toxins into the Klamath Estuary.	2, 3, 5	B	None	B
Dam removal and conversion of the reservoir areas to a free-flowing river could cause long-term increases in nutrient levels and periphyton biomass in the Klamath Estuary.	2, 3, 5	LTS	None	LTS
Marine Nearshore Environment				
Dam removal and conversion of the reservoir areas could cause long-term increases in freshwater phytoplankton and periphyton species of concern.	2, 3, 5	LTS	None	LTS
Keno Transfer				
Implementation of the Keno Transfer could cause adverse algae effects.	2, 3	NCFEC	None	NCFEC
East and West Side Facilities				
Decommissioning the East and West Side Facilities could cause adverse algae effects.	2. 3	NCFEC	None	NCFEC
KBRA				
Implementation of restoration actions, programs, and/or plans presented in the KBRA would accelerate restoration actions currently underway throughout the Klamath Basin and reduce nuisance and/or noxious phytoplankton blooms through their beneficial effects on flow and water quality.	2, 3	B	None	B

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Implementation of the Phase I Fisheries Restoration Plan could result in a long-term reduction in nutrients and associated decreases in nuisance and/or noxious phytoplankton and periphyton blooms.	2, 3	B	None	B
3.5 Terrestrial Resources				
Construction activities could result in the loss of wetland and riparian vegetation communities and culturally important species including willows.	2, 3, 4, 5	LTS	None	LTS
Construction activities could result in direct mortality or harm to special-status amphibian and reptile species during construction.	2, 3, 4, 5	LTS	None	LTS
Construction activities could result in nest abandonment by birds, including special-status bird species, during construction.	2, 3, 4, 5	LTS	TER-2: Nesting Bird Surveys TER-3: Bald and Golden Eagle Surveys	LTS
Construction activities could result in on the loss of special-status plants.	2, 3, 4, 5	LTS	TER-1: Habitat Restoration Plan TER-4: Surveys for Special Status Plants	LTS
Construction activities could result in adverse impacts on wildlife from riparian habitat loss.	2, 3, 4, 5	LTS	None	LTS
Removal of reservoirs and associated loss of habitat could result in impacts on wildlife.	2, 3, 5	LTS	None	LTS
Dam removal and the flushing of sediments could result in long-term impacts on riparian habitat from sedimentation in downstream reaches.	2, 3, 5	LTS	None	LTS
Removal of reservoirs could result in loss of reservoir wetlands.	2, 3, 5	S	TER-5: Permanent Loss of Wetlands at Reservoirs	LTS
Construction activities could result in the removal of trees and other vegetation and could result in long-term impacts on wildlife habitat, particularly for nesting birds.	2, 3, 4, 5	LTS	TER-1: Habitat Restoration Plan TER-2: Nesting Bird Surveys TER-3: Bald and Golden Eagle Surveys	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Removal of dam facilities could result in long-term impacts on bats from loss of roosting habitat.	2, 3, 5	S	TER-6: Impacts on Special-Status Bats from Loss of Roosting Habitat	LTS
Dam removal and the flushing of sediments could result in long-term impacts on amphibians from changes in habitat due to sedimentation in downstream reaches.	2, 3, 5	LTS	None	LTS
Removal of the reservoirs could result in long-term impacts on special-status species from loss of aquatic habitat at reservoirs.	2, 3, 5	LTS (Special Status Birds)	TER-2: Nesting Bird Surveys TER-3: Bald and Golden Eagle	LTS
Dam removal and associated sedimentation in downstream reaches could result in impacts on culturally important species.	2, 3, 5	LTS	None	LTS
Removal of reservoirs and associated facilities could result in long-term impacts on wildlife corridors.	2	B	None	B
Continued existence of the reservoirs and/or other facilities could present a barrier to movement of some terrestrial species.	1, 3, 4, 5	NCFEC	None	NCFEC
Exposed reservoir bottoms and other areas of construction disturbance could result in impacts from invasive plants.	2, 3, 4, 5	LTS	TER-1: Habitat Restoration Plan	LTS
Removal of Iron Gate Dam would require relocation of the Yreka Water Supply Pipeline which could result in impacts on terrestrial resources from construction activities and pipe alignment.	2, 3, 5	LTS	TER-1: Habitat Restoration Plan TER-2: Nesting Bird Surveys TER-3: Surveys for Special Status Plants	LTS
Removal of various recreation facilities could result in impacts to terrestrial resources during construction.	2, 3, 5	LTS	TER-1: Habitat Restoration Plan TER-2: Nesting Bird Surveys TER-3: Surveys for Special Status Plants	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Keno Transfer				
Implementation of the Keno Transfer could cause impacts to terrestrial resources.	2, 3	NCFEC	None	NCFEC
East and West Side Facilities				
Decommissioning the East and West Side Facilities could cause adverse effects to terrestrial resources.	2, 3	NCFEC	None	NCFEC
KBRA				
Construction activities associated with the Fisheries Restoration Plan- Phase I and Phase II could result in impacts on terrestrial wildlife and/or habitat.	2,3	S	TER-1: Habitat Restoration Plan TER-2: Nesting Bird Surveys TER-3: Surveys for Special-Status Plants TER-4: Permanent Loss of Wetlands at Reservoirs	LTS
Construction activities associated with Fish Entrainment Reduction could result in impacts on terrestrial wildlife and/or habitat	2,3	S	TER-1: Habitat Restoration Plan TER-2: Nesting Bird Surveys TER-3: Surveys for Special-Status Plants TER-4: Permanent Loss of Wetlands at Reservoirs	LTS
Modification of aquatic habitat from the Wood River Wetland Restoration project could result in impacts on terrestrial wildlife and/or habitat.	2,3	LTS	None	LTS
The Water Diversion Limitations, On-Project Plan, WURP, and Interim Flow and Lake Level Programs could result in impacts on terrestrial wildlife and/or habitat.	2,3	LTS	TER-2: Nesting Bird Surveys	LTS
The Mazama Forest Project could result in adverse impacts on terrestrial resources.	2,3	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.6 Flood Hydrology				
Continued operation of the Klamath Hydroelectric Project and Reclamation's Klamath Project could alter river flows and result in changes to flood risks.	1	NCFEC	None	NCFEC
Ongoing restoration actions could affect flood hydrology.	1	NCFEC	None	NCFEC
Drawdown of reservoirs could result in short-term increases in downstream surface water flows and could result in changes to flood risk.	2, 3, 5	LTS	None	LTS
Reservoir drawdown and resulting downstream sediment deposition could change flood risk.	2, 3, 5	LTS	None	LTS
Changes in flows following dam removal could result in changes to the 100-year floodplain downstream of Iron Gate Dam between River Mile 190 and 105.	2, 3, 5	S	H-1: Emergency Response Plan H -2: Move or Relocate Structures	LTS
Removing the Four Facilities could reduce the risks associated with a dam failure.	2	B	None	B
Removing Copco 1 and Iron Gate Dams could reduce the risks associated with a dam failure.	5	B	None	B
Removal of Iron Gate Dam would require relocation of the Yreka water supply pipeline which could affect flood risk.	2, 3, 5	NCFEC	None	NCFEC
Removal of recreation facilities located on the banks of the existing reservoirs which could affect flood hydrology.	2, 3, 5	NCFEC	None	NCFEC
Changes in flows in the Hydroelectric Reach including the J.C. Boyle and Copco 2 Bypass Reaches could affect flood hydrology.	4, 5	LTS	None	LTS
Construction of a new gage within the 100-year floodplain at Copco 2 Dam or J.C. Boyle Dam to measure flows could affect flood hydrology.	5	LTS	None	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Keno Transfer				
Implementation of the Keno Transfer could cause changes to operations affecting flows downstream of Keno Dam, which could cause changes to flood risks.	2, 3	NCFEC	None	NCFEC
East and West Side Facilities				
Decommissioning the East and West Side Facilities could cause changed in flood risk downstream of the facilities.	2, 3	NCFEC	None	NCFEC
KBRA				
Implementation of the Fisheries Restoration Plans could change flows downstream of Upper Klamath Lake, which could result in changes to flood risks	2, 3	LTS	None	LTS
Implementation of Wood River Wetland Restoration by the Bureau of Land Management may change flows upstream and downstream of Upper Klamath Lake, which could result in changes to flood risks.	2, 3	B	None	B
Implementation of Future Storage Opportunities by Reclamation may cause changes to flows upstream and down downstream of Upper Klamath Lake, which could result in changes to flood risks	2, 3	B	None	B
Implementation of the On-Project Plan may change flows downstream of Upper Klamath Lake during dry years, which could result in changes to flood risks.	2, 3	NCFEC	None	NCFEC
Implementation of the WURP would change flows upstream of Upper Klamath Lake, which could result in changes to flood risks.	2, 3	NCFEC	None	NCFEC
Implementation of an Emergency Response Plan could result in changes to flood risks in the event of failure to a Klamath Reclamation Project facility or dike on Upper Klamath Lake or Lake Ewauna.	2, 3	NCFEC	None	NCFEC
Implementation of Climate Change Assessment and Adaptive Management may change flows upstream and downstream of Upper Klamath Lake, which could result in changes to flood risks.	2, 3	B	None	B

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Implementation of Interim Flow and Lake Program during the interim period would change river flows, which could result in changes to flood risks.	2, 3	NCFEC	None	NCFEC
3.7 Groundwater				
Continued impoundment of water in the reservoirs with no changes in facility operations could result in impacts on groundwater resources.	1, 4	NCFEC	None	NCFEC
Implementation of ongoing restoration activities in the Klamath Basin could impact groundwater levels in the Upper Basin.	1, 4, 5	NCFEC	None	NCFEC
Continued impoundment of the water in the reservoirs could lead to increased groundwater storage.	1, 4, 5	B	None	B
Draining of the reservoirs could lower groundwater levels in the aquifer adjacent to the reservoirs, which could impact existing wells.	2, 3, 5	S	GW-1: Deepening or Replacement of an Existing Affected Groundwater Well	LTS
Removing the dams and eliminating the reservoirs could reduce recharge to groundwater.	2, 3, 5	LTS	None	LTS
Removal of Iron Gate Dam would require relocation of the Yreka water supply pipeline which could affect groundwater.	2, 3, 5	NCFEC	None	NCFEC
Dam removal activities would include the demolition of various recreation facilities which could affect groundwater.	2, 3, 5	NCFEC	None	NCFEC
Keno Transfer				
Implementation of the Keno Transfer could cause adverse effects to local groundwater.	2, 3	NCFEC	None	NCFEC
East and West Side Facilities				
Decommissioning the East and West Side Facilities could have adverse effects to groundwater resources.	2, 3	NCFEC	None	NCFEC
KBRA				
The Water Diversion Limitations program could reduce irrigation water in the driest years.	2,3	B (long-term)	None	B (long-term)

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Upland vegetation management under the WURP would increase inflow to Upper Klamath Lake.	2,3	B (long-term)	None	B (long-term)
The purchase and lease of water under the Interim Flow and Lake Level Program would increase water for fisheries.	2,3	LTS (short-term) B (long-term)	None	LTS (short-term) B (long-term
Implementation of an Emergency Response Plan could result in changes to groundwater following the failure of a Klamath Reclamation Project facility or dike on Upper Klamath Lake or Lake Ewauna.	2,3	NCFEC	None	NCFEC
3.8 Water Supply/Water Rights				
Continued operation of the Four Facilities could affect water supply operations.	1, 4	NCFEC	None	NCFEC
Ongoing restoration actions would continue to be implemented and could affect water supply availability.	1	NCFEC	None	NCFEC
Removal of Iron Gate Dam would require relocation of the Yreka water supply pipeline which could affect water supply.	2, 3, 5	NCFEC	None	NCFEC
Removal of various recreation facilities located on the banks of the existing reservoirs which could affect water supply or water rights.	2, 3, 5	NCFEC	None	NCFEC
Flow changes downstream of Iron Gate Dam could affect water supply downstream of Seiad Valley.	2, 3, 5	LTS	None	LTS
Changes in flow downstream of Iron Gate Dam could affect water rights holders.	2, 3, 5	LTS	None	LTS
Sediment release during reservoir drawdown could affect Klamath River geomorphology and water intake pumps downstream of Iron Gate Dam.	2, 3, 5	S	WRWS-1: Modifications to Intake Points	LTS
Trap and Haul – Programmatic Measure				
Implementation of the trap and haul measures could require water rights to divert water for the fish handling facilities	4, 5	LTS	None	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Keno Transfer				
Implementation of the Keno Transfer could cause changes to operations affecting water levels upstream of Keno Dam, which could cause changes to water supply or water rights.	2, 3	NCFEC	None	NCFEC
East and West Side Facilities				
Decommissioning of the East and Westside Facilities and redirecting of water flows could affect water users reliant on a diversion from the West Canal.	2, 3	NCFEC	None	NCFEC
KBRA				
Implementation of the trap and haul element of the Fisheries Reintroduction and Management would require water rights to divert water for the fish handling facilities.	2, 3	LTS	None	LTS
Implementation of Wood River Wetland Restoration by the Bureau of Land Management would result in changes to storage opportunities at Agency Lake, which could affect water supply.	2, 3	LTS	None	LTS
The study of additional off-stream storage opportunities in the Upper Klamath Basin to identify new storage opportunities, could affect water supply.	2, 3	NCFEC	None	NCFEC
Implementation of Water Diversion Limitations to Reclamation's Klamath Project could result in changes to water diversions, which may affect water rights and water supply.	2, 3	LTS	None	LTS
Implementation of the On-Project Plan to allow for full implementation of Water Diversion Limitations to Reclamation's Klamath Project would result in changes to water diversions for irrigation in dry years, which could affect water rights or adjudicated rights.	2, 3	B	None	B
Implementation of the Water Use Retirement Program increases instream flow to Upper Klamath Lake which could affect water rights upstream of Upper Klamath Lake.	2, 3	LTS	None	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Implementation of the Water Use Retirement Program increases instream flow to Upper Klamath Lake which could affect water supply upstream of Upper Klamath Lake.	2, 3	NCFEC	None	NCFEC
Implementation of Off-Project Water Settlement negotiations could affect water rights and adjudicated rights upstream of Upper Klamath Lake.	2, 3	B (resolved water rights	None	B (resolved water rights)
	2, 3	LTS (unresolved water rights)	None	LTS (unresolved water rights)
Implementation of Off-Project Reliance Program could change water deliveries for irrigation downstream of Upper Klamath Lake to Off-Project water users affecting water rights.	2, 3	LTS	None	LTS
Implementation of Drought Plan water and resource management actions could result in changes to water supply deliveries for Klamath Basin interests during drought years.	2, 3	B	None	B
Implementation of an Emergency Response Plan could result in a change to water supply deliveries in the event of failure to a Klamath Reclamation Project facility or dike on Upper Klamath Lake or Lake Ewauna.	2, 3	B	None	B
Implementation of Climate Change Assessment and Adaptive Management could result in changes to water deliveries depending on climatic changes	2, 3	B	None	B
Implementation of Interim Flow and Lake Program during the interim period could change water deliveries affecting water supply	2, 3	LTS	None	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.9 Air Quality				
Vehicle exhaust and fugitive dust emissions from dam removal activities and construction of fish passage could increase emissions of VOC, Nox, CO, SO2, PM10, and PM2.5 to levels that could exceed Siskiyou County's thresholds of significance.	2, 3,5	S	AQ-1: MY 2015 or newer engines for offroad construction equipment AQ-2: MY 2000 or newer engines for on-road construction equipment AQ-3: MY 2010 or newer engines for haul trucks AQ-4: Dust control measures during blasting operations	S
	4	LTS	None	LTS
Relocation of the City of Yreka water supply pipeline could result in short-term and temporary increases in criteria pollutant emissions from vehicle exhaust and fugitive dust that could exceed Siskiyou County's thresholds of significance.	2, 3, 5	LTS	None	LTS
Reservoir restoration actions could result in short-term and temporary increases in criteria pollutant emissions from the use of helicopters, trucks, and barges that could exceed Siskiyou County's thresholds of significance.	2, 3, 5	S	None	S
Relocation and demolition of various recreation facilities could result in short-term and temporary increases in criteria pollutant emissions from the operation of construction equipment that could exceed Siskiyou County's thresholds of significance.	2 , 3, 5	LTS	None	LTS
Fugitive dust emissions from demolition activities could impair visibility in Federal Class I areas.	2, 3, 4, 5	LTS	None	LTS
Interim Measures (IM's)				
Activities associated with interim measure (IM) 7 J.C. Boyle Gravel Placement and/or Habitat Enhancement, could result in short-term and temporary increases in criteria pollutants from vehicle exhaust and fugitive dust that could exceed Siskiyou County's thresholds of significance.	1,2,3	LTS	None	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Activities associated with interim measure (IM) 8 J.C. Boyle Bypass Barrier Removal could result in short-term and temporary increases in criteria pollutants from vehicle exhaust and fugitive dust that could exceed Siskiyou County's thresholds of significance.	1	LTS	None	LTS
Activities associated with interim measure (IM) 16 Water Diversions could result in short-term and temporary increases in criteria pollutants from vehicle exhaust and fugitive dust that could exceed Siskiyou County's thresholds of significance.	2,3	LTS	None	LTS
Trap and Haul Operations				
Implementation of trap and haul measures could result in temporary increases in air quality pollutant emissions from vehicle exhaust.	4, 5	S	AQ-1: Model Year 2015 Emissions Standards for Off-Road Construction Equipment AQ-2: Model Year 2000 or On-Road Emissions Standards for On-Road Construction Equipment AQ:3 Model Year 2010 Emissions Standards for On-Road Heavy Duty Vehicles	LTS
Keno Transfer				
Implementation of the Keno Transfer could have adverse effects on air quality.	2, 3	NCFEC	None	NCFEC
East and West Side Facilities				
Decommissioning the East and West Side Facilities could cause adverse air quality effects.	2, 3	LTS	None	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
KBRA				
Construction activities associated with the KBRA programs could result in temporary increases in air quality pollutant emissions from vehicle exhaust and fugitive dust.	2, 3	S	AQ-1: Model Year 2015 Emissions Standards for Off-Road Construction Equipment AQ-2: Model Year 2000 or On-Road Emissions Standards for On-Road Construction Equipment AQ:3 Model Year 2010 Emissions Standards for On-Road Heavy Duty Vehicles	S[3]
Operational activities associated with the Fisheries Reintroduction and Management Plan could result in temporary increases in air quality pollutant emissions from vehicle exhaust associated with trap and haul activities.	2, 3	S	AQ-1: Model Year 2015 Emissions Standards for Off-Road Construction Equipment AQ-2: Model Year 2000 or On-Road Emissions Standards for On-Road Construction Equipment AQ:3 Model Year 2010 Emissions Standards for On-Road Heavy Duty Vehicles	S[3]
3.10 Greenhouse Gases/Global Climate Change				
Vehicle exhaust from dam removal activities and construction of fish passage could increase GHG emissions in the short-term to levels that could exceed the designated significance criteria.	1	NCFEC	None	NCFEC
	2, 3, 4, 5	LTS	None	LTS
Relocation of the City of Yreka water supply pipeline could result in short-term increases in GHG emissions from vehicle exhaust.	2, 3, 5	LTS	None	LTS

[3] While Mitigation Measures AQ-1, 2, and 3 would be implemented to reduce impacts to LTS, emissions from any construction actions completed in the same year as hydroelectric facility removal actions may not be reduced to a less than significant level. Implementation of specific plans and projects described in the KBRA will require future environmental compliance as appropriate.

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Reservoir restoration actions could result in short-term increases in GHG emissions from the use of helicopters, trucks, and barges.	1, 2, 3, 5	LTS	None	LTS
The demolition of various recreation facilities which could result in short-term increases in GHG emissions from vehicle exhaust.	2, 3, 5	LTS	None	LTS
Removing or reducing a renewable source of power by removing the dams or developing fish passage could result in increased GHG emissions from possible non-renewable alternate sources of power.	1	NCFEC	None	NCFEC
	2, 3, 4, 5	S	CC-1 (market mechanisms); CC-2 (energy audit program); and CC-3 (energy conservation plan)	S
Interim Measures (IM's)				
Activities associated with interim measures (IM) 7 J.C. Boyle Gravel Placement and/or Habitat could result in short-term and temporary increases in GHG emissions from vehicle exhaust.	1,2,3	LTS	None	LTS
Activities associated with interim measures (IM) 8 J.C. Boyle Bypass Barrier Removal Enhancement could result in short-term and temporary increases in GHG emissions from vehicle exhaust.	1	LTS	None	LTS
Activities associated with interim measures (IM) 16 Water Divisions could result in short-term and temporary increases in GHG emissions from vehicle exhaust.	2,3	LTS	None	LTS
Trap and Haul Operations				
Implementation of trap and haul measures could result in temporary increases in GHG emissions from vehicle exhaust	4,5	LTS	None	LTS
Keno Transfer				
Implementation of the Keno Transfer could have adverse effects on greenhouse gases and climate change.	2, 3	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
East and Westside Facilities				
Decommissioning the East and West Side Facilities could cause adverse greenhouse gas and climate change effects.	2, 3	LTS	None	LTS
KBRA				
Construction activities associated with the KBRA programs involving construction could cause temporary increases in GHG emissions and climate change.	2, 3	LTS	None	LTS
Operational activities associated with the Fisheries Reintroduction and Management Plan could result in temporary increases in GHG emissions from vehicle exhaust associated with trap and haul activities.	2, 3	LTS	None	LTS
Implementation of the Power for Water Management Program of the KBRA could create new renewable energy sources which would provide affordable electricity to allow efficient use, distribution, and management of water.	2, 3	B	None	B
Implementation of the Drought Plan and the Climate Change Assessment and Adaptive Management Plan could affect climate change-related impacts.	2, 3	B	None	B
3.11 Geology, Soils, and Geologic Hazards				
Continued impoundment of water in the reservoirs could continue to trap sediment at rates similar to historical rates.	1, 4	NCFEC	None	NCFEC
Continued impoundment of water in the reservoirs could continue to prevent access to the diatomite beds at Copco 1 Reservoir.	1, 4	NCFEC	None	NCFEC
Draining of the reservoirs could uncover diatomite beds at Copco 1 Reservoir; however the land would be transferred to a State agency which would not allow commercial use, access to the mineral resource would not be changed.	2, 3, 5	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Construction and deconstruction activities could change erosion patterns through heavy vehicle use, excavation, and grading which could result in soil erosion.	2, 3, 4, 5	LTS	None	LTS
Draining of the reservoirs could cause instability along the banks of the reservoirs.	2, 3, 5	LTS	None	LTS
Draining of Copco 1 Reservoir could eliminate wave induced erosion thereby improving stability for upland hillsides and reducing the potential for erosion.	2, 3, 5	LTS	None	LTS
Draining of the reservoirs could cause river bank erosion downstream.	2, 3, 5	LTS	None	LTS
Draining of the reservoirs could result in short-term increases in sedimentation in slow-moving eddies and pools downstream from the reservoirs to the Klamath River estuary.	2, 3, 5	LTS	None	LTS
Draining of the reservoirs could result in changes to seismic or volcanic activity.	2, 3, 5	LTS	None	LTS
Draining of the reservoirs could result in long-term changes in the amount of erosion of the exposed reservoir bottom sediment remaining in the river channel.	2, 3, 5	LTS	None	LTS
Draining of the reservoirs could result in long-term changes to downstream sediment deposition from the erosion of remaining reservoir sediments.	2, 3, 5	LTS	None	LTS
Draining of the reservoirs could leave sediments that would dry out and could affect restoration activities and/or future road construction activities.	2, 3, 5	S	GEO-1: Geotechnical Analysis	LTS
Removal of Iron Gate Dam would require relocation of the Yreka water supply pipeline which could affect geology and soils.	2, 3,5	NCFEC	None	NCFEC
Dam removal activities would include the removal of various recreation facilities which could affect geology and soils.	2, 3, 5	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Keno Transfer				
The Keno Transfer could have adverse effects to geology, soils, or geologic hazards.	2, 3	NCFEC	None	NCFEC
East and West Side Facilities				
The decommissioning of the East and West Side Facilities could have adverse effects to geology, soils, or geologic hazards.	2, 3	NCFEC	None	NCFEC
KBRA				
Implementation of the Phase I Fisheries Restoration Plan could result in construction related sediment erosion.	2, 3	LTS (short term) B (long term)	None	LTS (short term) B (long term)
3.13 Cultural and Historic Resources				
Under the No Action/No Project Alternative current effects/impacts on historic properties/ historical resources, other cultural resources, and human remains will continue to occur.	1	NCFEC	None	NCFEC
The Proposed Action could result in direct effects/impacts to J.C. Boyle Dam, Copco 1 Dam, Copco 2 Dam, and Iron Gate Dam, their associated hydroelectric facilities, and on the KHHD, which is considered eligible for inclusion on the National Register and California Register.	2, 3, 5	S	CHR-1: Update the Klamath Hydroelectric Project Request for Determination CHR-2: MOU Under Section 106 and Preparation of Monitoring and Cultural Resources Management Plan CHR-3: Respect and Maintain Confidentiality of Sensitive Information CHR-4:Treatment of Indian Human Remains	S

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Reservoir drawdown associated with the Proposed Action could affect/impact archaeological and historic sites, TCPs, and cultural landscapes that are eligible for inclusion on the National Register and/or California Register and possibly Indian human remains.	2, 3, 5	S	CHR-1: Update the Klamath Hydroelectric Project Request for Determination CHR-2: MOU Under Section 106 and Preparation of Monitoring and Cultural Resources Management Plan CHR-3: Respect and Maintain Confidentiality of Sensitive Information CHR-4:Treatment of Indian Human Remains	LTS
Installation of the Yreka Water Supply Pipeline could affect/impact archaeological and historic sites that are eligible for inclusion on the National Register or California Register.	2, 3	S	CHR-1: Update the Klamath Hydroelectric Project Request for Determination CHR-2: MOU Under Section 106 and Preparation of Monitoring and Cultural Resources Management Plan CHR-3: Respect and Maintain Confidentiality of Sensitive Information CHR-4:Treatment of Indian Human Remains	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Construction activities including use of haul roads and disposal sites for demolition debris under the Proposed Action could affect/impact archaeological and historic sites, TCPs, and cultural landscapes that are eligible for inclusion on the National Register or California Register.	2, 3	S	CHR-1: Update the Klamath Hydroelectric Project Request for Determination CHR-2: MOU Under Section 106 and Preparation of Monitoring and Cultural Resources Management Plan CHR-3: Respect and Maintain Confidentiality of Sensitive Information CHR-4:Treatment of Indian Human Remains	LTS
Removal of the recreational facilities after reservoir drawdown may affect archaeological or historic sites that could be eligible for inclusion on the National Register or California Register or human remains.	2, 3	S	CHR-1: Update the Klamath Hydroelectric Project Request for Determination CHR-2: MOU Under Section 106 and Preparation of Monitoring and Cultural Resources Management Plan CHR-3: Respect and Maintain Confidentiality of Sensitive Information CHR-4:Treatment of Indian Human Remains	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
The Fish Passage at Four Dams Alternative could affect/impact the four dams and the KHHD, other historic properties/historical resources, TCPs, cultural landscapes, or human burials.	4, 5	S	CHR-1: Update the Klamath Hydroelectric Project Request for Determination CHR-2: MOU Under Section 106 and Preparation of Monitoring and Cultural Resources Management Plan CHR-3: Respect and Maintain Confidentiality of Sensitive Information CHR-4:Treatment of Indian Human Remains	LTS
Keno Transfer				
The Transfer of Keno Dam to the DOI could have adverse effects to historic properties or historic resources.	2, 3	B	None	B
East and West Side Facilities				
The decommissioning of the East and West Side Facilities could have adverse effects on historic resources or historic properties.	2, 3	LTS	None	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
KBRA				
Implementation of the KBRA fisheries restoration program could result in impacts/effects to archaeological and historic sites, TCPs, and cultural landscapes that are eligible for inclusion on the National Register and/or California Register and possibly Indian human remains.	2, 3	S	CHR-1: Update the Klamath Hydroelectric Project Request for Determination CHR-2: MOU Under Section 106 and Preparation of Monitoring and Cultural Resources Management Plan CHR-3: Respect and Maintain Confidentiality of Sensitive Information CHR-4:Treatment of Indian Human Remains	S[4]
Establishment of the Klamath Tribes Interim Fishing Site and implementation of the Mazama Forest Project could result in impacts/effects to archaeological and historic sites, TCPs, and cultural landscapes that are eligible for inclusion on the National Register and/or California Register and possibly Indian human remains.	2, 3	S	CHR-1: Update the Klamath Hydroelectric Project Request for Determination CHR-2: MOU Under Section 106 and Preparation of Monitoring and Cultural Resources Management Plan CHR-3: Respect and Maintain Confidentiality of Sensitive Information CHR-4:Treatment of Indian Human Remains	LTS
3.14 Land Use, Agricultural and Forest Resources				
The continued operation of and impoundment of water at the Four Facilities could conflict with applicable land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect.	1	NCFEC	None	NCFEC

[4] Studies will be conducted to identify cultural resources and reduce significant impacts to these resources. Implementation of specific plans and projects associated with the KBRA will require future environmental compliance as appropriate.

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
The exposure of the currently inundated lands from the removal of the Four Facilities could conflict with applicable land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect.	2, 3	NCFEC	None	NCFEC
The construction of fish passage infrastructure at the Four Facilities, or the construction activities associated with the removal of Copco 1 and Iron Gate dams and the construction of fish passage infrastructure at J.C. Boyle and Copco 2 could conflict with applicable land use plans, policies, or regulations adopted for the purpose of mitigating an environmental effect.	4, 5	NCFEC	None	NCFEC
The continued impoundment of water at the Four Facilities could result in the indirect conversion of farmland to non-agricultural use or conflict with the Williamson Act or agricultural zoning in the upper Klamath Basin due to uncertain water supplies.	1	NCFEC	None	NCFEC
Construction activities from the full or partial removal of the Four Facilities could result in the indirect conversion of farmland to non-agricultural use or conflict with the Williamson Act or agricultural zoning in the upper Klamath Basin due to uncertain water supplies.	2, 3	NCFEC	None	NCFEC
The construction of fish passage infrastructure at the Four Facilities, or the construction activities associated with the removal of Copco 1 and Iron Gate dams and the construction of fish passage infrastructure at J.C. Boyle and Copco 2, could result in the indirect conversion of farmland to non-agricultural use or conflict with the Williamson Act or agricultural zoning in the upper Klamath Basin due to uncertain water supplies.	4, 5	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Construction activities associated with full or partial dam removal, the construction of fish passage infrastructure, or the continued impoundment of water at Copco 2 and J.C. Boyle dams could result in the conversion of forest lands to non-forest use or conflict with forest zoning.	2, 3, 4, 5	NCFEC	None	NCFEC
Continued impoundment of water at the Four Facilities and construction activities associated with the development of fish passage could indirectly convert farmland to non-agricultural use or forest land to non-forest use.	1, 4	NCFEC	None	NCFEC
Construction activities associated with dam removal and the draining of the reservoirs could result in changes in the existing physical environment that could convert farmland to non agricultural use or convert forest land to non forest use.	2, 3, 5	LTS	None	LTS
Construction activities associated with dam removal could require new, permanent roads to be constructed to provide access to new recreation areas, which could constitute a change in the existing environment.	2, 3, 5	LTS	None	LTS
Dam removal would require the relocation of the Yreka water supply line and could result in a change in the existing environment and surrounding environment.	2, 3, 5	NCFEC	None	NCFEC
Construction and restoration activities associated with dam removal would include the demolition of various recreation facilities which could affect land use.	2, 3, 5	NCFEC	None	NCFEC
The construction and development of fish passage facilities would require new permanent roads to be created to provide access to the Klamath Hydroelectric Project facilities which could create conflicts with applicable plans and policies or otherwise cause a significant land use impact due to existing zoning and land uses.	4, 5	LTS	None	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Keno Transfer				
The transfer of ownership of Keno Dam from PacifiCorp to Reclamation could result in a change in land use.	2, 3	NCFEC	None	NCFEC
East and West Side Facilities				
The decommissioning of the East and West Side facilities could impact land use.	2, 3	NCFEC	None	NCFEC
KBRA				
The KBRA could conflict with applicable land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect.	2,3	LTS	None	LTS
The implementation of the Water Diversion Limitation Program could convert farmland to non-agricultural uses, a potentially significant effect.	2,3	LTS	None	LTS
The Water Use Retirement Program could result in the fallowing or conversion of agricultural land to non agricultural uses, such as open space or wetland restoration areas	2,3	B	None	B
The Power for Water Management Program could affect Land Use in the Klamath Project area.	2,3	LTS	None	LTS
The KBRA's Mazama Forest Project could result in the conversion of forest land to non-forest use or conflict with forest zoning.	2,3	NCFEC	None	NCFEC
3.17 Population and Housing				
Construction activities could employ non-local workers, who would need housing for the duration of their employment.	1	NCFEC	None	NCFEC
	2, 3, 4, 5	LTS	None	LTS
Construction, restoration, and monitoring activities associated with new programs could create new jobs and could employ non-local workers, who would need housing for the duration of their employment.	1	LTS	None	LTS
Dam removal would require relocation of the Yreka water supply pipeline and could result in an increase in construction workers requiring housing.	2, 3,5	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Removal of recreation facilities and related construction activities could result in an increase in construction workers requiring housing.	2, 3, 5	NCFEC	None	NCFEC
Keno Transfer				
The transfer of ownership of Keno Dam from PacifiCorp to Reclamation could affect population and housing.	2, 3	NCFEC	None	NCFEC
East and West Side Facilities				
The decommissioning of the East and Westside Facilities could impact population and housing.	2, 3	NCFEC	None	NCFEC
KBRA				
Construction and monitoring activities associated with the KBRA programs could employ non-local workers who would need housing for the duration of their employment.	2,3	LTS	None	LTS
3.18 Public Health and Safety, Utilities and Public Services, Solid Waste, Power				
Continued impoundment of water at the reservoirs under annual license renewals would allow hydropower generation to continue subject to the conditions of the Reclamation Biological Opinions, which would have the potential to decrease hydropower production.	1	NCFEC	None	NCFEC
Construction activities related to the ongoing restoration and management activities could impact public health and safety	1	NCFEC	None	NCFEC
Construction activities from dam removal could result in public health and safety risks.	2, 3, 4, 5	S	PHS-1: Public Safety Management Plan	LTS
Construction activities could increase public hazards by placing construction equipment in waterways, roadways, and other areas accessible by residents, recreational visitors, and potential spectators of the deconstruction activities.	2, 3, 4, 5	S	PHS-1: Public Safety Management Plan PHS-2: Fire Management Plan	LTS
Construction activities could increase the risk of wildfires.	2, 3, 4, 5	S	PHS-2: Fire Management Plan	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Dam removal would eliminate a water source for wildfire services and could increase response times.	2, 3, 5	LTS	None	LTS
Dam removal would eliminate a water source for residential firefighting in and around Copco Village, and could increase the risk to homes from fire.	2, 3, 5	LTS	None	LTS
Construction activities could affect police services by temporarily increasing the population of construction workers, lengthening response times due to construction traffic on area roads, and exposing construction areas to theft and/or vandalism.	2, 3, 4, 5	NCFEC	None	NCFEC
Construction activities could require the use of electricity and natural gas supplies in the study area.	2, 3, 4, 5	NCFEC	None	NCFEC
Construction activities could affect the City of Yreka's municipal water supply by damaging or exposing the Yreka water supply pipeline prior to its relocation.	2, 3, 5	LTS	None	LTS
The removal of recreational facilities currently located on the banks of the existing reservoirs could affect public health and safety	2, 3, 5	S	PS-1: Public Safety Management Plan PHS-2: Fire Management Plan	LTS
Construction activities could affect public services and utilities in the counties and cities in the study area.	2, 3, 4, 5	LTS	None	LTS
Construction activities could result in the need for new construction and access roads.	2, 3, 4, 5	LTS	None	LTS
Construction activities (including Signage and Construction Traffic Management BMP) could affect road conditions by increasing traffic from heavy construction vehicles which could affect public health and safety.	2, 3, 4, 5	LTS	None	LTS
Construction activities could generate a substantial amount of solid waste which could affect public services and utilities.	2, 3, 4, 5	LTS	None	LTS
Dam removal would remove existing hydropower facilities, resulting in a loss of hydropower generation which could affect the supply of electricity.	2, 3, 5	LTS	None	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Development of fish passage would reduce power generation at the existing hydropower facilities due to bypass stream flow requirements which could affect the supply of electricity.	4, 5	LTS	None	LTS
Dam removal could increase available mosquito habitat and could increase the risk of disease transmission in the short-term.	2, 3, 5	LTS	None	LTS
Leaving dam facilities and infrastructure in place which could have the potential to result in public health and safety risks.	4	NCFEC	None	NCFEC
	3, 5	LTS	None	LTS
Keno Transfer				
Under the Proposed Action, the Keno Facility will be transferred to the DOI, which could cause adverse effects to Public Health and Safety.	2, 3	NCFEC	None	NCFEC
East and West Side Facilities				
Under the Proposed Action, the East and West Side Facilities will be decommissioned, resulting in the loss of generated power.	2, 3	LTS	None	LTS
KBRA				
Prescribed burning and mechanical thinning under the Phase I and II Fisheries Restoration Plans could affect Public Services and Utilities.	2, 3	S (short-term); B (long-term)	PHS-2: Fire Management Plan	LTS (short-term); B (long-term)
Construction activities associated with the KBRA programs could result in public health and safety impacts.	2, 3	B (long-term)	None	B (long-term)
Implementation of the Power for Water Management Program could create new renewable energy sources.	2, 3	B	None	B
Completing the Emergency Response Plan could have beneficial effects on Public Services and Public Safety.	2, 3	B	None	B

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.19 Scenic Quality				
Continued impoundment of water at the Four Facilities could result in water quality impacts that could have long-term impacts on scenic quality.	1, 4	NCFEC	None	NCFEC
Continued existence of the buildings and other man-made structures could have the impact that they would remain inconsistent with the VRM classification of the surrounding area (where such inconsistency is defined as a criterion of significance).	1, 4, 5	NCFEC	None	NCFEC
Ongoing fish habitat restoration actions could result in short-term and long-term impacts on scenic resources.	1	S (short-term from construction); B (long-term)	None	S (short-term from construction); B (long-term)
Activities related to the Agency Lake and Barnes Ranches ongoing projects could result in long-term impacts to scenic resources.	1	B	None	B
Dam removal could result in impacts on scenic resources from removal of dams and facilities.	2, 3, 5	B	None	B
The removal of historic properties could result in impacts on scenic resources.	2, 3, 5	S	None	S
Dam removal could result in short and long-term impacts on scenic resources in formerly inundated reservoir areas.	2, 3, 5	S	None	S
Deconstruction and restoration activities could result in short-term impacts on scenic resources in the immediate vicinity of the Four Facilities.	2, 3, 5	S (short-term); B (long-term)	None	S (short-term); B (long-term)
Construction of a new, elevated City of Yreka water supply pipeline and steel pipeline bridge to support the pipe above the river could result in short and long-term impacts on scenic resources.	2, 3, 5	S	None	S
Replacement of the existing wooden Lakeview Bridge just downstream of Iron Gate Dam with a concrete bridge could result in short and long-term impacts on scenic resources.	2, 3	S (short-term); LTS (long-term)	None	S (short-term); LTS (long-term)

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Relocation of existing recreation facilities, such as campgrounds and boat ramps, from the reservoir banks to the new river shoreline would result in short and long-term impacts on scenic resources.	2, 3	S (short-term); LTS (long-term)	None	S (short-term); LTS (long-term)
Deconstruction activities could create a new source of light or glare that could adversely affect nighttime views in the area.	2, 3, 4, 5	S	SQ-1: Measures to Reduce Nighttime Light and Glare	LTS
Sediment release during dam and reservoir removal could cause temporary changes in water quality and the appearance of the Klamath River in the area of the dams and downstream from Iron Gate Dam.	2, 3, 5	S (short-term)	None	S (short-term)
Removal of the dams and facilities could result in long-term impacts on scenic resources from changes to water quality.	2, 3, 5	B	None	B
Demolition, construction, and restoration activities for the fishways could cause short-term adverse effects on the scenic vistas in the immediate vicinity of the Four Facilities.	4, 5	S	None	S
Construction of fishways could cause changes in the appearance of the Klamath River in the area of the dams and downstream from Iron Gate Dam.	4, 5	LTS	None	LTS
Fishways could cause substantial long-term impacts on scenic resources.	4, 5	S	None	S
Construction activities associated with fish collection facilities would introduce new features into the landscape.	4, 5	LTS (short-term); S (long-term)	None	LTS (short-term); S (long-term)
Keno Transfer				
Implementation of the Keno Transfer could affect scenic resources.	2, 3	NCFEC	None	NCFEC
East and West Side Facilities				
Decommissioning of the East and Westside canals and hydropower facilities could affect scenic resources.	2, 3	LTS	None	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
KBRA				
Construction activities associated with the Fisheries Restoration Plan- Phase I and Phase II could result in impacts on scenic resources.	2, 3	LTS	None	LTS
The Fisheries Restoration Plan- Phase I and Phase II could result in long-term impacts on scenic resources.	2, 3	B	None	B
Construction activities associated with fish collection facilities would introduce new features into the landscape.	2, 3	LTS (short-term); S (long-term)	None	LTS (short-term); S (long-term)
The Wood River Wetland Restoration Project could result in long-term impacts on scenic resources.	2, 3	LTS	None	LTS
Construction activities associated with the WURP could result in impacts on scenic resources.	2, 3	LTS	None	LTS
The Water Diversion Limitations, On-Project Plan, WURP, and Interim Flow and Lake Level Programs could result in long-term impacts on scenic resources.	2, 3	B/LTS	None	B/LTS
Construction activities associated with Fish Entrainment Reduction could result in impacts on scenic resources.	2, 3	LTS (short-term)	None	LTS
Fish Entrainment Reduction could result in long-term impacts on scenic resources.	2, 3	LTS	None	LTS
Construction activities associated with the Klamath Tribes Interim Fish Site could result in impacts on scenic resources.	2, 3	LTS	None	LTS
The Klamath Tribes Interim Fish Site could result in long-term impacts on scenic resources.	2, 3	LTS	None	LTS
3.20 Recreation				
Continued existence of the reservoirs could change existing recreation access and opportunities.	1,4	NCFEC	None	NCFEC
Construction activities associated with ongoing programs could temporarily restrict access to recreational opportunities.	1	LTS	None	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Construction activities associated with ongoing programs could result in short-term water quality impacts which could affect recreational opportunities.	1	LTS	None	LTS
Ongoing actions correcting fish passage issues, reintroducing and monitoring fish species, and restoring aquatic habitat could increase recreational fishing and wildlife viewing opportunities in the basin.	1	B	None	B
Construction activities could temporarily restrict recreational access on and in the vicinity of the reservoirs.	1, 4	NCFEC	None	NCFEC
	2, 3, 5	LTS	None	LTS
Construction activities, such as demolition, would generate temporary impacts (i.e., increased noise and dust) and could decrease the quality of recreational experiences in the vicinity of the reservoirs.	2, 3, 5	LTS	None	LTS
Reservoir removal could permanently decrease the availability of reservoir/lake-based recreational opportunities.	1, 4	NCFEC	None	NCFEC
	2, 3, 5	LTS	None	LTS
Removal of recreation facilities could limit access to recreational opportunities along and within the newly formed river channel.	2, 3, 5	S	REC-1: Prepare a plan to develop new recreational facilities and river access points	LTS
Changes in flow and water quality following dam removal could impact developed recreational facilities upstream and downstream of the reservoirs.	2, 3, 5	LTS	None	LTS
Downstream sediment release during reservoir drawdown could decrease the quality of water-contact-based-recreation in the short-term.	2, 3, 5	LTS	None	LTS
Removal of impoundments improves water quality and could impact water-contact-based recreational opportunities.	2, 3, 5	B	None	B
	1, 4	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Changes to the floodplain or river channel and removal of recreation facilities as a result of dam removal could affect access to whitewater boating opportunities.	2, 3, 5	NCFEC (downstream of Iron Gate); LTS (Hydroelectric Reach)	None	NCFEC (downstream of Iron Gate); LTS (Hydroelectric Reach)
Changes in flows following dam removal could increase the number of days with acceptable flows for various recreational activities in the Klamath River.	2, 3, 5	LTS	None	LTS
Changes in flows could increase the number of days with acceptable flows for whitewater boating and fishing in the J.C. Boyle and Copco 2 Bypass Reaches.	2, 3, 4, 5	LTS	None	LTS
Changes in flows could decrease the number of days with acceptable flows for whitewater boating and fishing in the Hells Corner Reach.	4	S (whitewater boating)	None	S (whitewater boating)
	2, 3, 5	S (whitewater boating); LTS (fishing)	None	S (whitewater boating); LTS (fishing)
Improved habitat for anadromous fish species following dam removal could affect recreational fishing opportunities in the long-term.	2, 3, 5	B	None	B
	4	LTS	None	LTS
Implementation of Mitigation Measure REC-1 could permanently reduce recreational opportunities in the Klamath Basin.	2, 3, 5	LTS	None	LTS
Keno Transfer				
Transfer of the Keno Facility from PacifiCorp to DOI could affect recreational opportunities.	2, 3	NCFEC	None	NCFEC
East and West Side Facilities				
The decommissioning of the East and West Side Facilities could have adverse effects on recreational resources.	2, 3	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
KBRA				
Construction activities associated with the KBRA could temporarily restrict recreational access.	2,3	LTS	None	LTS
Construction activities associated with KBRA programs could result in short-term water quality impacts which could affect recreational opportunities.	2,3	LTS	None	LTS
Fire treatment proposed in the Fisheries Restoration Plan could alter the visual setting and result in decreased recreational visitors to the Klamath Basin.	2,3	B (long-term)	None	B (long-term)
KBRA actions correcting fish passage issues, reintroducing and monitoring fish species, and restoring aquatic habitat could increase recreational fishing and wildlife viewing opportunities in the basin.	2,3	B	None	B
KBRA programs resulting in long-term water quality improvements could increase recreational opportunities throughout the Klamath Basin.	2,3	B	None	B
KBRA programs that enhance terrestrial wildlife and plant resources could increase recreational opportunities throughout the Klamath Basin.	2,3	B	None	B
3.21 Toxic/Hazardous Materials				
Continued operation of the Four Facilities could create a hazard to the public or the environment through the transport, use, or disposal of hazardous, toxic, or radiological waste (HTRW).	1, 4, 5	NCFEC	None	NCFEC
Construction activities could create a significant hazard to the public or the environment if they are located on a site which is included on a list of hazardous materials sites.	2, 3, 4, 5	NCFEC	None	NCFEC
Construction activities could create a hazard to the public or the environment through the transport, use, or disposal of HTRW.	2, 3, 4, 5	LTS	None	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Construction activities could create a hazard to the public or the environment through the abatement and disposal of asbestos and lead-based paint.	2, 3, 5	LTS	None	LTS
Construction activities could create a hazard to the public or the environment through the accidental release of hazardous materials into the environment.	2, 3, 4, 5	LTS	None	LTS
Construction activities required to relocate the Yreka water supply pipeline could create a hazard to the public or the environment through the accidental release of hazardous materials into the environment.	2, 3, 5	LTS	None	LTS
Removal of various recreation facilities could create a hazard to the public or the environment through the accidental release of hazardous materials into the environment.	2, 3, 5	LTS	None	LTS
Keno Transfer				
The transfer of the Keno Facility to DOI could result in affects to HTRW.	2, 3	NCFEC	None	NCFEC
East and West Side Facilities				
The decommissioning of the East and West Side Facilities could have adverse effects in terms of toxics and hazards.	2, 3	LTS	None	LTS
KBRA				
Construction activities associated with the KBRA programs could create a significant hazard to the public or the environment through the transport, use, or disposal of hazardous materials encountered during construction.	2,3	LTS	None	LTS
Construction activities associated with the KBRA programs could create a significant hazard to the public or the environment through the accidental release of hazardous materials during construction activities.	2,3	LTS	None	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.22 Traffic and Transportation				
Traffic Flow Effects				
Changes in traffic volumes could affect traffic flow.	1	NCFEC	None	NCFEC
Construction activities associated with the continued implementation of ongoing restoration actions could cause temporary effects to traffic and transportation.	1	S	Traffic best management practices	LTS
Construction vehicle trips could result in temporary traffic flow effects on I-5, OR66, US97, and access roads.	2, 3, 4, 5	LTS	None	LTS
Construction vehicle trips could result in temporary traffic flow effects on on-site roads.	2, 3, 4, 5	LTS	None	LTS
Construction vehicle trips during removal of recreation facilities associated with dam removal could result in temporary traffic flow effects on I-5, OR66, US97, and access roads.	2, 3, 5	LTS	None	LTS
Construction vehicle trips during the relocation of the Yreka water supply pipeline could result in temporary traffic flow effects on I-5, OR66, US97, and access roads.	2, 3, 5	LTS	None	LTS
Implementation of the interim measures (IM's) 8 J.C. Boyle Bypass Barrier Removal and IM 16 Water Diversions could result in temporary traffic flow effects on I-5, OR66, US97, and access roads.	2	LTS	None	LTS
Traffic Safety Effects				
Changes in traffic safety could occur.	1	NCFEC	None	NCFEC
Construction vehicle trips could cause traffic safety effects associated with the creation of dust along gravel roads.	2, 3, 5	LTS	None	LTS
Construction vehicle trips could cause traffic safety effects associated with vehicle turnouts along Copco Road, Topsy Grade/Ager-Beswick Road and OR66.	2, 3, 4, 5	LTS	None	LTS
Construction vehicle trips could cause traffic safety effects associated with sharp curves along Copco Road and OR66.	2, 3, 5	LTS	None	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Construction vehicle trips during the relocation of the Yreka water supply pipeline and removal of recreation facilities could cause traffic safety effects associated with sharp curves along Copco Road. The installation of signage at sharp corners would help to reduce this risk (See Appendix B).	2, 3, 5	LTS	None	LTS
The relocation of existing recreation facilities from the banks of the existing reservoirs down slope to the new river bed could result in traffic impacts along adjacent roadways.	2	LTS	None	LTS
Implementation of the interim measures (IM's) 7 J.C. Boyle Gravel Placement could cause traffic safety effects associated with sharp turns along Copco Road and OR66.	1,2,3	LTS	None	LTS
Implementation of the interim measures (IM's) 8 J.C. Boyle Bypass Barrier Removal could cause traffic safety effects associated with sharp turns along Copco Road and OR66.	1,2,3	LTS	None	LTS
Implementation of the interim measures (IM's) 16 Water Diversions could cause traffic safety effects associated with sharp turns along Copco Road and OR66.	2,3	LTS	None	LTS
Trap and Haul Operations				
Traffic associated with the implementation of the prescriptions and trap and haul operations would cause traffic safety effects on OR66 and US97, access roads, and onsite roads	4,5	LTS	None	LTS
Road Condition Effects				
Changes in road conditions could occur.	1	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Increased traffic volumes from heavy construction vehicles during construction activities could degrade road conditions and exceed bridge weight capacities. As part of the development of the construction plan, an in depth analysis of bridge and road capacity and state of repair will be conducted by the dam removal entity (DRE), with remedial actions taken prior to the commencement of facility deconstruction.	2, 3, 4, 5	S	TR-1: Relocate Jenny Creek Bridge and Culverts	LTS
Public Transit Effects				
Changes in public transit could occur.	1	NCFEC	None	NCFEC
Construction vehicle trip volumes and material hauling routes could affect regional transit service.	2, 3, 4, 5	LTS	None	LTS
Non-motorized Transportation Effects				
Changes in non-motorized transportation could occur.	1	NCFEC	None	NCFEC
The presence of construction vehicles along Copco and Topsy Grade/Ager-Beswick Roads could affect non-motorized transportation (i.e., bicyclists and pedestrians) due to high speeds and dust generation.	2, 3, 4, 5	LTS	None	LTS
Keno Transfer				
The transfer of the Keno Facility could impact traffic and transportation.	2, 3	NCFEC	None	NCFEC
East and West Side Facilities				
Activities associated with the decommissioning of the East and Westside Facilities could affect traffic and transportation.	2, 3	LTS	None	LTS
KBRA				
Activities associated with the KBRA actions that involve construction could cause temporary traffic effects.	2,3	LTS	None	LTS
Operational activities associated with the Fisheries Reintroduction and Management Plans could result in temporary traffic effects associated with trap-and-haul activities.	2, 3	LTS	None	LTS

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.23 Noise and Vibration				
Construction and deconstruction activities at the dam sites could cause a temporary increase in noise levels at Copco 1 Dam that could affect residents in the area.	1	NCFEC	None	NCFEC
	2, 3, 4, 5	S	NV-1: Noise and Vibration Control Plan	S
Construction and deconstruction activities at the dam sites could cause a temporary increase in nighttime noise levels at Iron Gate Dam.	1	NCFEC	None	NCFEC
	2, 3, 5	S	NV-1: Noise and Vibration Control Plan	S
	4	LTS	None	LTS
Reservoir restoration activities could result in short-term increases in noise levels in the project vicinity.	2, 3, 5	S	NV-1: Noise and Vibration Control Plan	S
Blasting activities at Copco 1 Dam could increase vibration levels.	2, 3, 5	S	NV-1: Noise and Vibration Control Plan	S
Construction activities at the dam sites could require the transport of waste to off-site landfills and construction worker commutes which would cause increases in noise along haul routes.	2, 3, 4, 5	LTS	None	LTS
Construction activities at the dam sites could increase short-term vibration levels.	2, 3,5	S	NV-1: Noise and Vibration Control Plan	S
	4	LTS	None	LTS
Trap and Haul – Programmatic Measure				
Trap and Haul operations could result in temporary increases in noise and vibration levels from vehicles used to relocate fish.	4, 5	S	NV-1: Noise and Vibration Control Plan	LTS
Keno Transfer				
The transfer of Keno dam to the DOI could have adverse effects on noise and vibration.	2, 3	NCFEC	None	NCFEC

Table 5-1. Summary of Environmental Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
East and West Side Facilities				
The decommissioning of the East and West Side Facilities could have adverse effects on Noise and Vibration.	2, 3	LTS	None	LTS
KBRA				
Construction activities associated with the KBRA could cause temporary increases in noise and vibration levels.	2,3	S	NV-1: Noise and Vibration Control Plan	LTS
Operational activities associated with the Fisheries Reintroduction Management Plan could result in temporary increases in noise and vibration levels from vehicles associated with trap-and-haul activities.	2, 3	S	NV-1: Noise and Vibration Control Plan	LTS

KEY:
Significance:
NCFEC = No Change From Existing Conditions
B = Beneficial
LTS = Less than Significant
S = Significant
N/A = Not Applicable
Alternatives:
1 = No Action/No Project
2 = Full Facilities Removal of Four Dams Alternative (Proposed Action)
3 = Partial Facilities Removal of Four Dams Alternative
4 = Fish Passage at Four Dams Alternative
5 = Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative

Table 5-2. Summary of Significant and Unavoidable Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.2 Water Quality				
Water Temperature				
Upper Klamath Basin				
Dam removal and/or elimination of hydropower peaking operations at J.C. Boyle Powerhouse could cause short-term[5] and long-term[6] alterations in daily water temperatures and fluctuations in the J.C. Boyle bypass and peaking reaches.	2, 3, 5	S for J.C. Boyle bypass reach	None	S for J.C. Boyle bypass reach
Dam removal and conversion of the reservoir areas to a free-flowing river could cause short-term and long-term increases in spring time water temperatures and decreases in late summer/fall water temperatures in the Hydroelectric Reach downstream of Copco 1 Reservoir.	2, 3, 5	S for springtime	None	S for springtime
Lower Klamath Basin				
Dam removal and conversion of the reservoir areas to a free flowing river could result in short-term and long-term increases in spring water temperatures and decreases in late summer/fall water temperatures in the Lower Klamath River	2, 3, 5	S – Iron Gate Dam to Salmon River for springtime	None	S – Iron Gate Dam to Salmon River for springtime
Suspended Sediments				
Upper Klamath Basin				
Draining the reservoirs and release of sediment could cause short-term increases in suspended material in the Hydroelectric Reach downstream of J.C. Boyle Dam.	2, 3, 5	S	None	S

[5] Short-term is defined as <2 years following dam removal.
[6] Long-term is defined as 2-50 years following dam removal.

Table 5-2. Summary of Significant and Unavoidable Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Lower Klamath Basin				
Draining the reservoirs and release of sediment could cause short-term increases in suspended material in the lower Klamath River and the Klamath Estuary.	2, 3, 5	S	None	S
Dissolved Oxygen				
Upper Klamath Basin				
Draining the reservoirs and release of sediment could cause short-term increases in oxygen demand (Immediate Oxygen Demand [IOD] and Biological Oxygen Demand [BOD]) and reductions in dissolved oxygen in the Hydroelectric Reach downstream of J.C. Boyle Reservoir.	2, 3, 5	S	None	S
Lower Klamath Basin				
Dam removal and sediment release could cause short-term increases in oxygen demand (Immediate Oxygen Demand [IOD] and Biological Oxygen Demand [BOD]) and reductions in dissolved oxygen in the lower Klamath River, the Klamath Estuary, and the marine nearshore environment.	2, 3, 5	S (lower Klamath River from Iron Gate Dam to Clear Creek)	None	S (lower Klamath River from Iron Gate Dam to Clear Creek)
3.3 Aquatic Resources				
Critical Habitat				
Reservoir drawdown associated with dam removal could alter the quality of critical habitat.	2, 3, 5	S (short-term for coho)	None	S (short-term for coho)
Essential Fish Habitat				
Reservoir drawdown associated with dam removal could alter the quality of EFH.	2, 3, 5	S (short-term for Chinook and coho)	None	S (short-term for Chinook and coho)

Table 5-2. Summary of Significant and Unavoidable Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Species Impacts				
Coho Salmon				
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect coho salmon.	2, 3, 5 (would only remove Copco 1 and Iron Gate)	S (Upper Klamath River, Mid-Klamath River, Shasta River, and Scott River	AR-1: Protection of mainstem spawning; AR-2: Protection of outmigrating juveniles; AR-3: Fall flow pulses; AR-4: Hatchery management	S (Upper Klamath River, Mid-Klamath River, Shasta River, and Scott River population units)
Steelhead				
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect steelhead in the short-term.	2, 3, 5	S	AR-1: Protection of mainstem spawning; AR-2: Protection of outmigrating juveniles; AR-3: Fall flow pulses; AR-4: Hatchery management	S
Pacific Lamprey				
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect Pacific lamprey in the short-term.	2, 3, 5	S	(Alternative 2 only) AR-1: Protection of mainstem spawning; AR-2: Protection of outmigrating juveniles; AR-3: Fall flow pulses; AR-4: Hatchery management	S
Green Sturgeon				
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect green sturgeon.	2, 3, 5	S	AR-3: Fall flow pulses;	S
Freshwater mussels				
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect freshwater mussels in the short-term.	2, 3, 5	S	AR-7: Freshwater mussel relocation	S

Table 5-2. Summary of Significant and Unavoidable Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Benthic Macroinvertebrates				
Reservoir drawdown associated with dam removal could alter SSCs and bedload sediment transport and deposition and affect macroinvertebrates.	2, 3, 5	S	None	S
3.4 Algae				
Hydroelectric Reach				
Dam removal and the elimination of hydropower peaking operations could result in long-term increased biomass of nuisance periphyton in low-gradient channel margin areas within the Hydroelectric Reach.	2, 3, 5	S	None	S
3.9 Air Quality				
Vehicle exhaust and fugitive dust emissions from dam removal activities could increase emissions of VOC, NOx, CO, SO_2, PM_{10}, and $PM_{2.5}$ to levels that could exceed Siskiyou County's thresholds of significance.	2, 3	S	AQ-1: MY 2015 or newer engines for offroad construction equipment AQ-2: MY 2000 or newer engines for on-road construction equipment AQ-3: MY 2010 or newer engines for haul trucks	S
Reservoir restoration actions could result in short-term and temporary increases in criteria pollutant emissions from the use of helicopters, trucks, and barges that could exceed Siskiyou County's thresholds of significance.	2, 3, 5	S	None	S
Trap and Haul Operations				
Implementation of trap and haul measures could result in temporary increases in air quality pollutant emissions from vehicle exhaust.	4, 5	S	None	S

Table 5-2. Summary of Significant and Unavoidable Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
KBRA				
Construction activities associated with the KBRA programs could result in temporary increases in air quality pollutant emissions from vehicle exhaust and fugitive dust.	2, 3	S	AQ-1: MY 2015 or newer engines for offroad construction equipment AQ-2: MY 2000 or newer engines for on-road construction equipment AQ-3: MY 2010 or newer engines for haul trucks	S[7]
Operational activities associated with the Fisheries Reintroduction and Management Plan could result in temporary increases in air quality pollutant emissions from vehicle exhaust associated with trap-and-haul activities.	2, 3	S	AQ-1: MY 2015 or newer engines for offroad construction equipment AQ-2: MY 2000 or newer engines for on-road construction equipment AQ-3: MY 2010 or newer engines for haul trucks	S
3.10 Greenhouse Gases/Global Climate Change				
Removing or reducing a renewable source of power by removing the dams or developing fish passage could result in increased GHG emissions from possible non-renewable alternate sources of power.	2, 3, 4, 5	S	CC-1: Market Mechanisms); CC-2: Energy Audit Program; and CC-3: Energy Conservation Plan	S

[7] While Mitigation Measures AQ-1, 2, and 3 would be implemented to reduce impacts to LTS, emissions from any construction actions completed in the same year as hydroelectric facility removal actions may not be reduced to a less than significant level. Implementation of specific plans and projects described in the KBRA will require future environmental compliance as appropriate.

Table 5-2. Summary of Significant and Unavoidable Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
3.13 Cultural and Historic Resources				
The Proposed Action could result in direct effects/impacts to J.C. Boyle Dam, Copco 1 Dam, Copco 2 Dam, and Iron Gate Dam, their associated hydroelectric facilities, and on the KHHD, which is considered eligible for inclusion on the National Register and California Register.	2, 3, 5	S	CHR-1: Update the Klamath Hydroelectric Project Request for Determination CHR-2: MOU Under Section 106 and Preparation of Monitoring and Cultural Resources Management Plan CHR-3: Respect and Maintain Confidentiality of Sensitive Information CHR-4:Treatment of Indian Human Remains	S
KBRA				
Implementation of the KBRA programs including the Phase 1 and 2 Fisheries Restoration Plans, Fisheries Reintroduction and Management Plan, Wood River Wetland Restoration Project, On-Project Plan, Water Use Retirement Program, Fish Entrainment Reduction, Klamath Tribes Interim Fishing Site, and Mazama Forest Project could result in impacts/effects to archaeological and historic sites, TCPs, and cultural landscapes that are eligible for inclusion on the National Register and/or California Register and possibly Indian human remains.	2, 3	S	None	S[8]
Establishment of the Klamath Tribes Interim Fishing Site could result in impacts/effects to archaeological and historic sites, TCPs, and cultural landscapes that are eligible for inclusion on the National Register and/or California Register and possibly Indian human remains.	2, 3	S	None	S[8]

[8] Studies will be conducted to identify cultural resources and reduce significant impacts to these resources. Implementation of specific plans and projects associated with the KBRA will require future environmental compliance as appropriate.

Table 5-2. Summary of Significant and Unavoidable Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Implementation of the Mazama Forest Project could result in impacts/effects to archaeological and historic sites, TCPs, and cultural landscapes that are eligible for inclusion on the National Register and/or California Register and possibly Indian human remains.	2, 3	S	None	S[8]
3.19 Scenic Quality				
Ongoing fish habitat restoration actions could result in short-term and long-term impacts on scenic resources.	1	S (short-term from construction)	None	S (short-term from construction)
The removal of historic properties could result in impacts on scenic resources.	2, 3, 5	S	None	S
Dam removal could result in short and long-term impacts on scenic resources in formerly inundated reservoir areas.	2, 3, 5	S	None	S
Deconstruction and restoration activities could result in short-term impacts on scenic resources in the immediate vicinity of the Four Facilities.	2, 3, 5	S (short-term)	None	S (short-term)
Construction of a new, elevated City of Yreka water supply pipeline and steel pipeline bridge to support the pipe above the river could result in short and long-term impacts on scenic resources.	2, 3, 5	S (short-term)	None	S (short-term)
Replacement of the existing wooden Lakeview Bridge just downstream of Iron Gate Dam with a concrete bridge could result in short and long-term impacts on scenic resources.	2, 3	S (short-term)	None	S (short-term)
Relocation of existing recreation facilities, such as campgrounds and boat ramps, from the reservoir banks to the new river shoreline would result in short and long-term impacts on scenic resources.	2, 3	S (short-term)	None	S (short-term)
Sediment release during dam and reservoir removal could cause temporary changes in water quality and the appearance of the Klamath River in the area of the dams and downstream from Iron Gate Dam.	2, 3, 5	S	None	S

Table 5-2. Summary of Significant and Unavoidable Impacts

Potential Impact	Alternative(s)	Significance Pursuant to CEQA	Proposed Mitigation	Significance After Mitigation Pursuant to CEQA
Demolition, construction, and restoration activities for the fishways could cause short-term adverse effects on the scenic vistas in the immediate vicinity of the Four Facilities.	4, 5	S	None	S
Fishways could cause substantial long-term impacts on scenic resources.	4, 5	S	None	S
Trap and Haul Operations				
Construction activities associated with fish collection facilities would introduce new features into the landscape.	4, 5	S (long-term)	None	S (long-term)
KBRA				
Construction activities associated with fish collection facilities would introduce new features into the landscape.	2, 3	S (long-term)	None	S (long-term)
3.20 Recreation				
Changes in flows could decrease the number of days with acceptable flows for whitewater boating and fishing in the Hells Corner Reach.	2, 3, 4, 5	S (whitewater boating)	None	S (whitewater boating)
3.23 Noise and Vibration				
Construction and deconstruction activities at the dam sites could cause a temporary increase in noise levels at Copco 1 Dam that could affect residents in the area.	2, 3, 5	S	NV-1: Noise and Vibration Control Plan	S
Construction and deconstruction activities at the dam sites could cause a temporary increase in nighttime noise levels at Iron Gate Dam.	2, 3, 5	S	NV-1: Noise and Vibration Control Plan	S
Reservoir restoration activities could result in short-term increases in noise levels in the project vicinity.	2, 3, 5	S	NV-1: Noise and Vibration Control Plan	S
Blasting activities at Copco 1 Dam could increase vibration levels.	2, 3, 5	S	NV-1: Noise and Vibration Control Plan	S
Construction activities at the dam sites could increase short-term vibration levels.	2, 3,5	S	NV-1: Noise and Vibration Control Plan	S

KEY:
Significance:
NCFEC = No Change From Existing Conditions
B = Beneficial
LTS = Less than Significant
S = Significant
N/A = Not Applicable
Alternatives:
1 = No Action/No Project
2 = Full Facilities Removal of Four Dams Alternative (Proposed Action)
3 = Partial Facilities Removal of Four Dams Alternative
4 = Fish Passage at Four Dams Alternative
5 = Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative

Table 5-3: Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
3.12 Tribal Trust			
The Klamath Tribes			
Continued operation of the four Klamath River dams would result in no change from existing conditions to the trust resources of The Klamath Tribes and other resources traditionally used by The Klamath Tribes.	1, 4	NCFEC	None
Removal of the Four Facilities and implementation of KBRA plans and programs, would address most of the water quality and aquatic resources issues related to The Klamath Tribes' trust resources and other resources traditionally used by the Tribes (see Sections 3.2, 3.3, and 3.5).	2, 3	B	None
	5 (at Copco and Iron Gate Reservoirs only)	B	None
Construction of fishways at the four dams would address a portion of the critical issues related to migratory fish that were identified by The Klamath Tribes, however the remaining critical issues affecting their trust resources and other resources traditionally used by the Klamath Tribes would persist.	4	B	None
KBRA			
Implementation of the Tribal Fisheries and Conservation Management Program could result in impacts/effects to Trust Resources and other traditionally used resources.	2, 3	B	None
Implementation of the Mazama Forest Project could result in impacts/effects to Trust Resources and other traditionally used resources.	2, 3	B	None
Quartz Valley Tribe			
The Quartz Valley Reservation is not along the Klamath River and the Tribe does not have a reserved Klamath River fishery or reserved water rights; thus there would be no impact from dam removal or construction of fish passage facilities.	1, 2, 3, 4, 5	NCFEC	None
Karuk			
Continued operation of the four Klamath River dams would result in no change from existing conditions to the trust resources of the Karuk and other resources traditionally used by the Karuk.	1, 4	NCFEC	None

Table 5-3: Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
Removal of the Four Facilities and implementation of KBRA plans and programs, would address most of the water quality and aquatic resources issues related to the Karuk trust resources and other resources traditionally used by the Tribes (see Sections 3.2, 3.3, and 3.5).	2, 3	B	None
	5 (at Copco and Iron Gate Reservoirs only)	B	None
Construction of fishways at the four dams would address a portion of the critical issues related to migratory fish that were identified by the Karuk, however the remaining critical issues affecting their trust resources and other resources traditionally used by the Karuk would persist.	4	B	None
KBRA			
Implementation of the Tribal Fisheries and Conservation Management Program could result in impacts/effects to traditionally used resources.	2, 3	B	None
Hoopa Valley Indian Tribe			
Continued operation of the four Klamath River dams would result in no change from existing conditions to the trust resources of the Hoopa Valley Indian Tribe and other resources traditionally used by the Hoopa Valley Indian Tribe.	1, 4	NCFEC	None
Removal of the Four Facilities and implementation of KBRA plans and programs, would address most of the water quality and aquatic resources issues related to the Hoopa Valley Indian Tribe trust resources and other resources traditionally used by the Tribes (see Sections 3.2, 3.3, and 3.5).	2, 3	B	None
	5 (at Copco and Iron Gate Reservoirs only)	B	None
Construction of fishways at the four dams would address a portion of the critical issues related to migratory fish that were identified by the Hoopa Valley Indian Tribe, however the remaining critical issues affecting their trust resources and other resources traditionally used by the Hoopa Valley Indian Tribe would persist.	4	B	None
KBRA			
Implementation of the Tribal Fisheries and Conservation Management Program could result in impacts/effects to Trust Resources and other traditionally used resources.	2, 3	B	None

Table 5-3: Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
Yurok			
Continued operation of the four Klamath River dams would result in no change from existing conditions to the trust resources of the Yurok Tribe and other resources traditionally used by the Yurok.	1, 4	NCFEC	None
Removal of the Four Facilities and implementation of KBRA plans and programs, would address most of the water quality, terrestrial, and aquatic resources issues related to the Yurok Tribe trust resources and other resources traditionally used by the Yurok (see Sections 3.2, 3.3, and 3.5).	2, 3	B	None
	5 (at Copco and Iron Gate Reservoirs only)	B	B
Construction of fishways at the four dams would address a portion of the critical issues related to migratory fish that were identified by the Yurok Tribe, however the remaining critical issues affecting their trust resources and other resources traditionally used by the Yurok would persist (see Sections 3.2 and 3.3).	4	B	None
KBRA			
Implementation of the Tribal Fisheries and Conservation Management Program could result in impacts/effects to Trust Resources and other traditionally used resources.	2, 3	B	None
Resighini Rancheria			
Continued operation of the four Klamath River dams would result in no change from existing conditions to the trust resources of the Resighini Rancheria and other resources traditionally used by the Resighini Rancheria.	1, 4	NCFEC	None
Removal of the Four Facilities and implementation of KBRA plans and programs, would address most of the water quality, terrestrial, and aquatic resources issues related to the Resighini Rancheria trust resources and other resources traditionally used by the Resighini Rancheria (see Sections 3.2, 3.3, and 3.5).	2, 3	B	None
	5 (at Copco and Iron Gate Reservoirs only)	B	None
Construction of fishways at the four dams would address a portion of the critical issues related to migratory fish that were identified by the Resighini Rancheria, however the remaining critical issues affecting their trust resources and other resources traditionally used by the Resighini Rancheria would persist (see Sections 3.2 and 3.3).	4	B	None

Table 5-3: Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
3.15 Socioeconomics			
Four Facilities			
Changes in annual O&M expenditures required to continue the operation of the existing facilities could affect employment, labor income, and output in the regional economy.	1, 4	NCFEC	None
	2, 3, 5	Adverse	None
Construction activities associated with dam removal and fish passage facilities would increase economic output, employment, and labor income during the construction period in Klamath and Siskiyou Counties.	2, 3, 4, 5	B (short-term)	None
Mitigation spending after the deconstruction period could increase economic output, employment, and labor income in the regional economy.	2, 3, 4, 5	B (short-term)	None
Commercial Fishing			
Changes in commercial fishing harvests could change fishing revenues and affect employment, labor income, and output in the regional economy.	1	NCFEC	None
	2, 3, 4, 5	B (long-term)	None
Recreation			
Changes to reservoir recreation expenditures could affect employment, labor income, and output in the regional economy.	1, 5 (due to continued use of J.C. Boyle Reservoir)	NCFEC	None
	2, 3, 5 (due to removal of Copco and Iron Gate Reservoirs)	Adverse	None
Changes to in-river sport fishing opportunities could affect recreational expenditures and employment, labor income, and output in the regional economy.	1	NCFEC	None
	2, 3, 4, 5	B (long-term)	None
Changes to ocean sport fishing could affect recreational expenditures in the regional economy.	1	NCFEC	None
	2, 3, 4, 5	B (long-term)	None

Table 5-3: Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
Changes to whitewater boating opportunities could affect recreational expenditures and employment, labor income, and output in the regional economy.	1	NCFEC	None
	2, 3, 4, 5	Adverse (from reduced whitewater boating expenditures in the Upper Klamath River and Hell's Corner Reach)	None
Indian Tribes			
The continuation of dam operations could affect existing economic conditions of Indian Tribes in the area of analysis.	1	NCFEC	None
Dam removal and the construction of fish passage could increase fish harvest for subsistence, cultural practices and commercial uses and provide economically beneficial opportunities for Indian Tribes residing on the Klamath River (excluding the Hoopa Valley Tribe, who reside on the Trinity River).	2, 3, 4, 5	B	None
PacifiCorp Hydroelectric Service			
Energy rates for PacifiCorp customers could change.	1, 4, 5	UKN	None
Removal of the Four Facilities could result in increased energy rates for PacifiCorp customers.	2, 3	NCFEC	None
Property Values and Local Government Revenues			
Property values surrounding Iron Gate and Copco Reservoirs could change.	1, 4, 5 (around Copco 2 Reservoir)	NCFEC	None
	2, 3, 5 (around Copco 1 and Iron Gate Reservoirs)	Adverse (short-term); UKN (long-term)	None
Changes in real estate values around Copco 1 and Iron Gate Reservoirs could affect property tax revenues to Siskiyou County.	2, 3, 5	Adverse (short-term); UKN (long-term)	None
	4	NCFEC	None
Removal of the Four Facilities could affect property tax revenues to Siskiyou and Klamath Counties from PacifiCorp.	2, 3, 5	NCFEC	None

Table 5-3: Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
Construction worker spending could increase sales and use tax receipts in Siskiyou and Klamath Counties.	2, 3	B (short-term)	None
Changes in visitation for recreation activities could affect sales tax revenues.	2, 3	UKN	None
PacifiCorps Property Taxes			
PacifiCorp's property tax payments to Siskiyou and Klamath Counties could change.	1, 4	NCFEC	None
Ongoing Restoration Activities			
Ongoing restoration activities could generate employment, labor income, and output in the regional economy.	1, 4	NCFEC	None
Irrigated Agriculture			
Changes in Reclamation's Klamath Project hydrology could affect farm revenues, employment, labor income, and output in the regional economy.	1, 4	NCFEC	None
Changes in on-farm pumping costs could affect farm revenues, employment, labor income, and output in the regional economy.	1, 4	NCFEC	None
Water acquisitions could affect farm revenues, employment, labor income, and output in the regional economy.	1, 4	NCFEC	None
Refuge Recreation			
Changes in water supply could affect visitor spending for refuge recreation and affect employment, labor income, and output in the regional economy.	1, 4	NCFEC	None
Tribal Program			
Ongoing fisheries and conservation management by The Klamath Tribes, Karuk Tribe, and Yurok Tribe could generate employment, labor income, and output in the regional economy.	1, 4	NCFEC	None
KBRA			
Fish habitat restoration for the Fisheries Program could affect employment, labor income, and output in the regional economy.	2, 3	B (during project implementation)	None
In the long-term, the Fisheries Program could support increased fish abundance in the Klamath River and tributaries.	2, 3	B (long-term)	None
Construction, analysis, and monitoring activities under the Water Resources Program could affect employment, labor income, and output in the regional economy.	2, 3	B (during project implementation)	None

Table 5-3: Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
Changes in the Reclamation Klamath Project hydrology could affect gross farm revenue and the regional economy.	2, 3	B (long-term)	None
Increases in on-farm pumping costs could affect household income and reduce employment, labor income, and output in the regional economy.	2, 3	Adverse	None
Water acquisitions via permanent, voluntary water rights sales could affect farm revenues and employment, labor income, and output in the regional economy.	2, 3	B	None
Water acquisitions via short-term water leasing could decrease farm revenues and reduce employment, labor income, and output in the regional economy.	2, 3	Adverse (short-term)	None
Changes in water supply could affect refuge recreation expenditures and employment, labor income, and output in the regional economy.	2, 3	B	None
Implementation of regulatory assurances under the KBRA could support employment, labor income, and output in the regional economy.	2, 3	B/NCFEC	None
Implementation of the Klamath County Economic Development Plan could support long-term economic growth in Klamath County.	2, 3	B	None
Funds from the California Water Bond Legislation could be used by Siskiyou County to improve economic conditions in the county and to support future economic growth.	2, 3	B	None
Construction and monitoring activities associated with Tribal Program actions would increase jobs, labor income, and output for The Klamath Tribes, Karuk Tribe, and Yurok Tribe.	2, 3	B	None
3.16 Environmental Justice			
Changes to fisheries could disproportionately affect tribal people.	1	NCFEC	None
	2, 3, 4, 5	B	None
Increased traffic, air quality emissions, and noise associated with construction activities could disproportionately affect county residents and tribal people.	1	NCFEC	None
	2, 3, 4, 5	Disproportionate Effects (short-term)	Air Quality (Section 3.9) and Noise and Vibration (Section 3.23) mitigation measures

Table 5-3: Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
Release of sediment from reservoirs could cause disproportionate short term impacts on county residents and tribal people.	1	NCFEC	None
	2, 3	NCFEC (short-term, inorganic and organic contaminants); Disproportionate Effect (short-term, reduced mussel populations)	None
Changes to water quality could cause disproportionate long term water quality impacts on county residents and tribal people.	1, 4, 5	NCFEC	None
	2, 3	B	None
Changes in county revenues could decrease county funding of social programs used by county residents.	1, 4	NCFEC	None
	2, 3, 5	Disproportionate Effects	None
Changes to water quality and fish populations could disproportionately impact tribal health and social wellbeing in the long term.	1, 4, 5	NCFEC	None
	2, 3	B	None
Traffic on associated haul roads could disproportionately affect county residents and tribal people.	2, 3, 4, 5	Disproportionate Effects (short-term); NCFEC (long-term)	Traffic and Transportation (Section 3.22) mitigation measures
Dam removal activities and construction of fish passage could provide jobs for county residents and tribal people that are low income and minority.	2, 3, 4, 5	B (short-term)	None
The installation of the Yreka water supply pipeline could disproportionately affect county residents or tribal people.	2, 3	NCFEC	None
Relocation of existing recreation facilities from the banks of the existing reservoirs down slope to the new river bed could disproportionately affect county residents or tribal people.	2, 3	NCFEC	None

Table 5-3: Summary of Environmental Effects Relative to NEPA

Potential Impact	Alternative(s)	Effect Pursuant to NEPA	Mitigation
Keno Transfer			
The Keno Transfer could have adverse effects on environmental justice issues.	2, 3	NCFEC	None
East and Westside Facilities			
The East and West Side Facilities decommissioning could have adverse effects on environmental justice issues.	2, 3	NCFEC	None
KBRA			
Implementation of the Phases I and II Fisheries Restoration Plans, the Fisheries Monitoring Plan, the Fisheries Reintroduction and Management Plan, and the Klamath River Tribes Interim Fishing Site could disproportionately affect tribal populations.	2, 3	B	None
Implementation of the Water Use Retirement Program, Off-Project Reliance Program, and Interim Flow and Lake Level Program could disproportionately affect low income and minority farm workers.	2, 3	Disproportionate Effects (short-term); NCFEC (long-term)	None
Implementation of the Tribal Fisheries and Conservation Management Program could disproportionately affect the tribes.	2, 3	B	None
Implementation of the Tribal Programs Economic Revitalization could disproportionately affect the tribes.	2, 3	B	None
Implementation of the Mazama Forest Project could disproportionately affect the tribes.	2, 3	B	None
Implementation of the Klamath County Economic Development Plan could disproportionately affect low income and minority people in Klamath County.	2, 3	B	None
Implementation of the California Water Bond Legislation could disproportionately affect low income and minority people in Siskiyou County.	2, 3	B	None

KEY:
Significance:
NCFEC = No Change From Existing Conditions
B = Beneficial
LTS = Less than Significant
S = Significant
N/A = Not Applicable
Alternatives:
1 = No Action/No Project
2 = Full Facilities Removal of Four Dams Alternative (Proposed Action)

3 = Partial Facilities Removal of Four Dams Alternative
4 = Fish Passage at Four Dams Alternative
5 = Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative

Table 5-4. Wild and Scenic River Resource Effects

Potential Impact	Alternatives	Effect	Proposed Mitigation	Effect After Mitigation
Wild and Scenic River Assessment – Scenic Evaluation				
Dam removal could result in changes to water flow character (river flows and accompanying river width, depth, and channel inundation or exposure) compared with conditions present when the Oregon component was designated as a National WSR.	2, 3, 5	B	None	B
Dam removal could result in changes to water flow character (river flows and accompanying river width, depth, and channel inundation or exposure) compared with conditions present when the California component was designated as a National WSR.	2, 3, 5	B	None	B
Dam removal could result in changes to water appearance (clarity, turbidity, depth of view, color, and prominence of algae) compared with conditions present when the California and Oregon components were designated as National WSRs.	2, 3, 5	B	None	B
Increases in anadromous fish habitat and improvements in water quality following dam removal could result in increases in the population of large anadromous fish species and resulting changes in opportunities for fish and wildlife viewing compared with conditions present when the California and Oregon components were designated as National WSRs.	2, 3, 5	B	None	B
Improvements to riparian habitat in the California and Oregon WSR components following dam removal could affect opportunities for river-dependent wildlife viewing compared with conditions present when the California and Oregon components were designated as National WSRs.	2, 3	B	None	B
Dam removal and restoration of the riverine corridor could result in changes to riparian vegetation compared with conditions present when the Oregon Klamath River component was designated as National WSRs.	2, 3, 5	B	None	B

Table 5-4. Wild and Scenic River Resource Effects

Potential Impact	Alternatives	Effect	Proposed Mitigation	Effect After Mitigation
Dam removal and restoration of the riverine corridor could result in changes to riparian vegetation compared with conditions present when the California Klamath River component was designated as National WSRs.	2, 3	B	None	B
Dam removal and the resulting presence of a more natural setting and character could result in changes to the natural appearing landscape character as compared with conditions present when the Oregon Klamath River component was designated as National WSRs.	2, 3, 5	B	None	B
Dam removal and the resulting presence of a more natural setting and character could result in changes to the natural appearing landscape character as compared with conditions present when the California Klamath River component was designated as National WSRs.	2, 3	B	None	B
Wild and Scenic River Assessment – Recreation Evaluation				
Flow changes following dam removal could affect opportunities for whitewater boating compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs.	2, 3, 5	S, short-term (Oregon WSR component); NE, short-term (California WSR component); B (long-term)	None	S, short-term (Oregon WSR component); NE, short-term (California WSR component); B (long-term)
Changes to flows and fish habitat could result in long-term effects to recreational fishing compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs.	2, 3, 5	B	None	B

Table 5-4. Wild and Scenic River Resource Effects

Potential Impact	Alternatives	Effect	Proposed Mitigation	Effect After Mitigation
Removal of reservoirs could result in changes to opportunities for other recreational activities (water play, swimming, camping) compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs.	2, 3, 5	S	REC-1: Prepare a plan to develop new recreational facilities and river access points	LTS
Dam removal could improve the recreational setting (water-quality related aesthetics, odors, tastes, contacts, and public health and safety aspects) compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs.	2, 3, 5	B	None	B
Wild and Scenic River Assessment – Fisheries Evaluation				
Dam removal could alter stream flow regime compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs.	2, 3, 5	B	None	B
A more natural flow regime following dam removal could decrease fall water temperatures compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs.	2, 3, 5	B (California WSR component); NE (Oregon WSR component)	None	B (California WSR component); NE (Oregon WSR component)
Dam removal would improve water quality characteristics (physical, biological, and chemical) and reduce fish crowding compared to conditions present when the California and Oregon Klamath River components were designated as National WSRs.	2, 3, 5	B	None	B
The release of sediment during reservoir drawdown would alter geomorphic conditions, sediment transport regime, and substrate quality compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs.	2, 3, 5	B	None	B

Table 5-4. Wild and Scenic River Resource Effects

Potential Impact	Alternatives	Effect	Proposed Mitigation	Effect After Mitigation
Improved water quality, decreased fish disease, and more natural habitat conditions following dam removal could affect conditions for anadromous fish species compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs.	2, 3, 5	B	None	B
Restored connectivity between the lower and upper Klamath River, a natural flow regime in place of existing reservoirs, and water quality improvements following dam removal could affect conditions for resident fish species compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs.	2, 3, 5	B	None	B
Restored connectivity between the lower and upper Klamath River, a natural flow regime in place of existing reservoirs, and water quality improvements following dam removal could affect conditions for species traditionally used and culturally important to Indian Tribes compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs.	2, 3, 5	B	None	B
Wild and Scenic River Assessment – Wildlife Evaluation				
Removal of reservoirs and creation of riparian habitat could affect habitat for special status species compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs.	2, 3, 5	B	None	B

Table 5-4. Wild and Scenic River Resource Effects

Potential Impact	Alternatives	Effect	Proposed Mitigation	Effect After Mitigation
Implementation of the prescriptions provided by the USFWS, DOI, and DOC in the FERC 2007 EIS could change whitewater boating opportunities in the Hell's Corner reach.	4	S	None	S

KEY:
Significance:
NCFEC = No Change From Existing Conditions
B = Beneficial
LTS = Less than Significant
S = Significant
N/A = Not Applicable
Alternatives:
1 = No Action/No Project
2 = Full Facilities Removal of Four Dams Alternative (Proposed Action)
3 = Partial Facilities Removal of Four Dams Alternative
4 = Fish Passage at Four Dams Alternative
5 = Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative

5.5 Significant and Unavoidable Impacts

Significant and unavoidable adverse effects refer to the environmental consequences of an action that cannot be avoided by redesigning the project, changing the nature of the project, or implementing mitigation measures. NEPA requires a discussion of any adverse impacts that cannot be avoided (40 CFR Section 1502.15). The CEQA Guidelines require a discussion on significant environmental effects that cannot be avoided as well as those that can be mitigated but not reduced to an insignificant level (Section 15126.2 (b) and Section 15126.2(a)). This section discusses the significant and unavoidable impacts of the Klamath River dam removal alternatives presented in Chapter 2, Project Description.

5.5.1 Water Quality

Implementation of the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would result in short-term (<2 years following dam removal) and long-term (2-50 years following dam removal) increases in summer/fall water temperatures and daily fluctuations in the J.C. Boyle Bypass Reach due to the elimination of hydropower peaking operations. This would be a significant and unavoidable impact for the J.C. Boyle Bypass Reach. Similarly, implementation of these alternatives would result in potentially significant increases in springtime water temperatures in the Hydroelectric Reach downstream of Copco 1 Reservoir.

Short-term significant and unavoidable impacts would result from sediment release (and corresponding increases in suspended sediment concentrations [SSCs]) associated with dam removal under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative. These short-term (<2 years following dam removal) increases in SSCs would result in a significant impact in the Hydroelectric Reach. In the Lower Klamath Basin, sediment release from dam removal under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would exceed applicable North Coast Basin Plan water quality objectives for suspended material in the lower Klamath River and the Klamath Estuary and would substantially adversely affect the cold freshwater habitat (COLD) beneficial use. Thus, these short-term increases in SSCs would be significant and unavoidable in the lower Klamath River and the Klamath Estuary.

Dissolved oxygen impacts are anticipated to be secondary impacts of the sediment release during reservoir drawdown. Under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative, elevated SSCs during reservoir drawdown and dam removal would result in decreases in dissolved oxygen in the Hydroelectric Reach downstream of J.C. Boyle Reservoir and in the lower Klamath River from Iron Gate Dam to Clear Creek. These decreases in dissolved oxygen would be significant and unavoidable impacts.

5.5.2 Aquatic Resources

Under the Proposed Action, elevated levels of SSCs during the 2 to 3 month reservoir drawdown period would result in short-term significant and unavoidable impacts on critical habitat for coho salmon as well as essential fish habitat for Chinook and coho salmon. SSCs and bedload sediment transport and deposition under the Proposed Action would result in the loss of coho and fall-run Chinook salmon, Pacific Lamprey, green sturgeon and summer and winter steelhead individuals present in the mainstem after drawdown in January 2020. Based on the substantial reduction in the abundance of a year class in the short-term, the loss of these individuals during short-term increases in SSCs and bedload movement would be significant and unavoidable. For coho, this significant and unavoidable impact applies to the coho salmon from the Upper Klamath River, Mid-Klamath River, Shasta River, and Scott River population units.

The Proposed Action and changes in bed substrate from the erosion of accumulated sediments and changed substrate characteristics in the Klamath River during reservoir drawdown would affect mussels. Given the substantial reduction in the abundance of multiple year classes in the short term and the slow recovery time of freshwater mussels, the effects would be significant for mussels in the short term. Similar significant and unavoidable impacts would occur for benthic macroinvertebrates.

The Partial Facilities Removal Alternative and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would result in similar short-term significant and unavoidable impacts related to suspended sediment concentrations and bedload movement. These impacts would occur for fall-run Chinook, coho, steelhead, Pacific Lamprey, green sturgeon, freshwater mussels, and benthic macroinvertebrates.

5.5.3 Algae

The Proposed Action and Partial Facilities Removal Alternative would result in increases in nutrient inputs from the Upper Klamath Basin that could increase periphyton biomass in low-gradient channel areas in the Hydroelectric Reach; this impact would be significant and unavoidable.

Development of the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would result in increased nutrient transport to downstream reaches and result in changes to the periphyton community composition. This impact would be significant and unavoidable in the Hydroelectric Reach downstream of J.C. Boyle Dam.

5.5.4 Air Quality

Under the Proposed Action and Partial Facilities Removal Alternatives, total emissions of Particulate Matter <10 microns (PM_{10}) from construction equipment exhaust, on-road haul trucks, commuting vehicles, and fugitive dust emissions from unpaved roads and general earth moving activities would exceed Siskiyou County's thresholds of significance. This impact could not be mitigated to less than significant with implementation of the mitigation measures in Section 3.9, Air Quality, and would remain a significant and unavoidable impact. Reservoir restoration activities under the Proposed

Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would result in short-term and temporary increases in criteria pollutant emissions from the use of helicopters, trucks, and barges. These impacts would be significant and unavoidable.

Construction activities associated with the KBRA programs could result in temporary increases in air quality pollutant emissions from vehicle exhaust and fugitive dust. These short-term impacts would be significant and unavoidable and implementation of mitigation measures in Section 3.9, Air Quality, would not reduce these to less than significant. Additionally, operational activities associated with the Fisheries Reintroduction and Management Plan could result in short-term increases in air quality pollutant emissions from vehicle exhaust associated with trap-and-haul activities. Implementation of the mitigation measures in Section 3.9, Air Quality, would not reduce these impacts to less than significant, thus they would remain significant and unavoidable impacts.

5.5.5 Greenhouse Gases/Global Climate Change

Implementation of the Proposed Action and decommissioning and removal of Iron Gate, Copco 1, and Copco 2 dams (which are California Renewable Portfolio Standard [RPS]-eligible facilities) is contrary to implementation of AB 32 but the significance would diminish as new renewable sources are developed. Although it is expected that PacifiCorp would add new sources of renewable power that would replace the removed dams, the analysis in Section 3.10, Greenhouse Gases/Global Climate Change, provides a conservative assumption that emissions could still occur when the dams are removed.

Section 3.10, Greenhouse Gases/Global Climate Change, describes that the California Air Resources Board expects that implementation of its Scoping Plan (2008) would reduce 21.3 million metric tons carbon dioxide equivalent by 2020 (from 2005 baseline) from California's RPS; therefore, the possible increase in emissions from removing the dams would account for three percent of the expected emissions reduction. Under a business-as-usual scenario, which assumes that the Scoping Plan would not be implemented, this would impede California's ability to meet its emission reduction goal. While mitigation measures in Section 3.10, Greenhouse Gases/Global Climate Change, would be implemented to reduce emissions from power replacement, it is expected that greenhouse gas emissions would remain significant and unavoidable in the short-term until PacifiCorp adds new sources of renewable power that would replace the removed dams. Implementation of the Partial Facilities Removal Alternative, the Fish Passage at Four Dams Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would also result in the reduced operation or decommissioning of the power generating facilities of the dams; thus, electricity generation capacity would require replacement with other sources of power.

5.5.6 Cultural and Historic Resources

Under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative some, if

not all, of the Four Facilities and their associated hydroelectric facilities would be removed. These facilities are part of the Klamath Hydroelectric Historic District (KHHD), which is eligible for the NRHP. Removal of these structures constitutes a significant and unavoidable impact.

Implementation of the following KBRA programs would include ground disturbing activities that are likely to have a significant impact on cultural and historic resources that are eligible for inclusion on the National Register and/or California Register. These KBRA programs include:

- Phases 1 and 2 Fisheries Restoration Plans
- Fisheries Reintroduction and Management Plan
- Wood River Wetland Restoration Project
- On-Project Plan
- Water Use Retirement Program
- Fish Entrainment Reduction
- Klamath Tribes Interim Fishing Site
- Mazama Forest Project

Studies will be conducted to identify cultural resources and measures to reduce significant impacts to those resources. As described in Section 3.13, Cultural and Historic Resources, implementation of specific plans and projects associated with Phase 1 and 2 Fisheries Restoration will require future environmental compliance as appropriate.

Additional KBRA programs that would likely have significant impacts on archaeological and historic sites; traditional cultural properties (TCPs); cultural landscapes that are eligible for inclusion on the National Register and/or California Register; and, possibly, on Indian human remains include the establishment of the Klamath Tribes Interim Fishing Site and the Mazama Forest Project. While construction-related BMPs would be implemented to reduce impacts from ground disturbing activities related to the establishment of the Klamath Tribes interim fishing site, actual implementation of specific plans associated with this will require future environmental compliance as appropriate. Under the Mazama Forest Project, the 90,000 acres identified in the Mazama Forest Project are likely to include cultural and historic resources that are eligible for inclusion on the National Register and/or California Register. While implementation of specific forest management plans are likely to have significant impacts on cultural and historic resources eligible for inclusion on the National Register and/or California Register, these specific plans and projects associated with the Mazama Forest Project will require future environmental compliance as appropriate.

5.5.7 Socioeconomics

Under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative, reduced annual operations and maintenance (O&M) expenditures required to continue the operation of the dams and existing facilities could affect employment, labor income, and

output in the regional economy. These reductions in O&M expenditures would result in long-term adverse effects in the regional economy.

The Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would result in reduced reservoir recreation opportunities associated with dam and reservoir removal and could reduce recreational expenditures in the regional economy. If visitors prefer to recreate in a reservoir setting rather than the new river setting, they may choose to recreate outside of the region. Losses in recreation spending would directly affect several industries in the region and would result in secondary impacts on support industries. In addition, implementation of any of these three dam removal alternatives would result in loss of jobs and incomes for PacifiCorp workers employed in Siskiyou and Klamath Counties.

Another adverse effect would result from losses in whitewater boating opportunities under the Proposed Action and the Partial Facilities Removal Alternative. Specifically, flow decreases in the Hell's Corner Reach would result in losses of commercial trips and corresponding losses in recreation expenditures in the local economy.

Dam removal and the removal of Copco 1 and Iron Gate Reservoirs under the Proposed Action, Partial Facilities Removal Alternative, and Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would affect private parcels with partial reservoir views, frontage/access or with river views subsequent to the action. While a majority of the applicable private parcels are vacant residential land and single-family residential, changes caused by dam removal would have adverse effects on property values in the short-term. However, the net magnitude of these changes is difficult to forecast. In the long-term, land values of parcels downstream of Iron Gate Dam with river views could increase because of restoration of the river, including improved water quality and more robust anadromous fish runs. Along the same lines, if some land values are reduced and there are no offsetting increases in other property values, Siskiyou County property tax revenues might decline relative to the No Action/No Project Alternative, assuming nothing else changes that might impact property tax revenues, (e.g., tax rates). This would result in a short-term adverse impact.

Under the KBRA, increases in on-farm pumping costs would affect household income and reduce employment, labor income, and output in the regional economy. Under the Proposed Action and the Partial Facilities Removal Alternative, irrigators are pumping more groundwater compared to the No Action/No Project Alternative and therefore are paying more for electricity under the Proposed Action and Partial Facilities Removal even with a decrease in electricity rates assumed in the Proposed Action (Reclamation 2011 and Reclamation 2011b). Thus, a reduced household income due to increased pumping costs would have a relatively small adverse impact on the regional economy.

Water acquisitions via short-term water leasing, which could occur as part of KBRA programs like the Off-Project Reliance Program and the Interim Flow and Lake Level Program, could decrease farm revenues and reduce employment, labor income, and output in the regional economy. These programs allow farmers to sell or lease their water

for fisheries programs on a short term basis when sufficient water is unavailable for fish. The regional economy would be affected by the loss in gross farm revenue generated on the land idled by farmers who voluntarily lease water. While some of these regional effects would be offset by household induced effects when farmers spend a portion of the compensation in the local area, short-term water leasing proposed in the KBRA is expected to have a short term, adverse effect on the regional economy.

5.5.8 Environmental Justice

Implementation of the action alternatives would result in short-term construction-related impacts to air quality, traffic (including traffic on associated haul roads used during construction), and noise. These effects would likely result in short-term disproportionate effects to county residents and tribal people. Sediment release during reservoir drawdown would result in reduced freshwater mussel populations which would disproportionately affect tribes that rely on the mussels as a food source. This would be a short-term disproportionate effect to tribal people.

Section 3.15, Socioeconomics, describes that the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would cause short-term and long-term declines in tax revenues to the counties in the area of analysis stemming from a discontinuation of tax revenue from PacifiCorp and a short-term decrease in property values near the reservoirs. Reductions in the counties' budgets and resulting reductions or eliminations in social programs would disproportionately affect low income and minority county residents and tribal people.

Under the KBRA, implementation of the WURP, Off-Project Reliance Program, and Interim Flow and Lake Level Program could result in voluntary land fallowing and permanent water right sales. In turn, farm labor jobs could be lost which could disproportionately affect low-income, minority farm workers, who could lose a portion of their income if farms no longer required their labor. These would be short-term disproportionate effects.

5.5.9 Scenic Quality

Ongoing fish habitat restoration actions would occur under the No Action/No Project Alternative throughout the entire basin with the exception of the Trinity River Basin. Activities related to these actions including floodplain rehabilitation, large woody debris replacement, fish passage correction, and cattle exclusion fencing, among others would include construction activities which could result in short-term significant impacts on scenic resources. These impacts would be significant and unavoidable in the short-term.

Implementation of the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would result in the removal of some historic properties. While the removal of buildings in and return to a natural landscape is preferable under the BLM's Visual Resource Management (VRM) process, some historic scenery elements may be considered socially

valued and their elimination from the scenic character would be considered a significant and unavoidable scenery impact of the project.

In addition to the removal of historic properties, removal of dams and reservoirs would result in substantial changes in the former reservoir areas during drawdown and until restoration is complete. Receding water in the current reservoirs would expose reservoir sediment. It is expected that the river channel would appear very similar to conditions before the river was impounded (with exception of vegetation not yet being established). The alternatives would involve stabilizing and revegetating the newly exposed reservoir areas with herbaceous and woody vegetation. Until the restoration was complete, however, the area would appear barren and/or sparsely vegetated. Additionally, Section 3.19, Scenic Quality, describes that studies estimate that it will take 30 years for the river corridor habitats to fully recover from the dam removals (Phillip Williams and Associates [PWA] 2009). Thus, these impacts on scenic resources would be significant and unavoidable in both the short and long-term.

Sediment release during reservoir drawdown would also result in temporary significant and unavoidable impacts to water aesthetics (clarity, turbidity (depth of view), and color). The impact on the appearance of the Klamath River would be temporary; however, as no mitigation measures could be implemented to reduce the impact on scenic resources, it would be significant and unavoidable.

Deconstruction, restoration, and construction activities associated with the Proposed Action, the Partial Facilities Removal Alternative, the Fish Passage at Four Dams Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would result in areas around the dams and in the vicinity of construction being inconsistent with the surrounding natural landscape and the VRM classification. Specifically, scenic quality changes during deconstruction, restoration, and construction activities would be caused by the temporary presence of large construction vehicles and equipment, temporary structures, temporary access roads, equipment storage areas, material stockpiles, piles of demolition materials, and other common construction items that would detract from the natural surroundings. These temporary impacts on scenic resources would be significant and unavoidable.

The addition of the fishways, under the Fish Passage at Four Dams Alternative and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative, would change the scenic character in the vicinity of the dams by adding hardscape elements that would blend with the facility features but would not blend with the natural landscape and could dominate views due to their size. At Copco 1 and Iron Gate Dams, the fishway structures would be particularly large (see Table 3.19-3 in Section 3.19, Scenic Quality). Although the fishways have not yet been designed, they likely could display angular geometry, continuous straight lines, and flat surfaces that may moderately contrast with the colors, forms, and textures of the surrounding characteristic landscape, or may be insignificant compared to scenery impacts of the existing dam facilities. Thus, the addition of fishways could be a significant, permanent impact. No mitigation measures could be implemented to lessen the impact on scenic quality.

5.5.10 Recreation

Under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative, the Hell's Corner Reach of the Klamath River, which currently provides whitewater boating opportunities, would lose acceptable and predictable flows necessary for whitewater boating. Less predictability would inhibit the ability of commercial outfitters to provide whitewater boating opportunities on a regular scheduled basis. This water flow impact on whitewater boating opportunities would be a significant and unavoidable impact.

5.5.11 Noise and Vibration

Construction activities at the Copco 1 Development associated with the Proposed Action, the Partial Facilities Removal Alternative, the Fish Passage at Four Dams Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would produce noise and vibration levels resulting in significant and unavoidable impacts that could affect sensitive receptors in the area. Noise impacts would be significant and unavoidable for outdoor receptors during construction.

Construction activities at Iron Gate Dam would cause temporary increases in nighttime noise levels for the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative resulting in a significant and unavoidable impact. Reservoir restoration activities in the vicinity of the dams and reservoirs would also result in short-term increases in noise levels. Impacts related to vibration produced during construction activities under the Proposed Action, the Partial Facilities Removal Alternative, and the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative would be significant and unavoidable. These short-term noise and vibration impacts would remain significant and unavoidable even after implementation of the mitigation measure in Section 3.23, Noise and Vibration.

5.6 Environmentally Preferable/Superior Alternative

NEPA requires the Lead Agency to identify the alternative or alternatives that are environmentally preferable in the Record of Decision (ROD) (40 CFR Part 1505.2(b)). The environmentally preferable alternative generally refers to the alternative that would result in the fewest adverse effects to the biological and physical environment. It is also the alternative that would best protect, preserve, and enhance historic, cultural, and natural resources. Although this alternative must be identified in the ROD, it need not be selected for implementation.

Section 15126.6(e)(2) of the CEQA Guidelines requires agencies to identify the environmentally superior alternative in a draft EIR. If the No Project Alternative is the environmentally superior alternative, an additional environmentally superior alternative must be identified among the other alternatives.

CDFG has identified Alternative 3 (Partial Facilities Removal of Four Dams) as the environmentally superior alternative. All of the alternatives evaluated in the EIS/EIR, including the No Action/No Project Alternative, have significant unavoidable environmental impacts as identified in Section 5.5. Alternative 2 (Full Facilities Removal of Four Dams, the Proposed Action), Alternative 3, and Alternative 5 (Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate) would have the most short-term significant and unavoidable impacts among the alternatives. These impacts would largely be limited to the time frame of direct dam deconstruction actions and sediment release. After dam deconstruction, impacts would include the loss of reservoir recreation and local economic impacts. Alternatives 2, 3, and 5 would significantly improve water temperature, dissolved oxygen, and algal toxins for aquatic resources and reduce the incidence of fish disease in juvenile salmon by removing the two largest reservoirs—Copco I and Iron Gate. Alternatives 4 and 5 would maintain some power production and recreational benefits thereby reducing local economic impacts.

Although the No Action/No Project Alternative will have no change from existing conditions resulting from construction, this alternative is note the environmentally superior alternative when compared to the Proposed Action, which is intended to improve environmental conditions. Alternative 3 is the environmentally superior alternative when compared with the Proposed Action because it would:

- Reduce the air quality impacts from emissions of volatile organic compounds (VOCs), nitrogen oxides (NOx), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter < 10 microns (PM_{10}), and particulate matter < 2.5 microns ($PM_{2.5}$) from reduced construction activities;
- Reduce the contribution to greenhouse gases from reduced construction activities;
- Reduce noise and vibration from reduced construction activities;
- Reduce impacts to terrestrial plants and wildlife from fewer truck trips;
- Reduce disturbance to archaeological and historic sites from fewer truck trips;
- Retain structures for roosting bats; and
- Retain historically significant structures at Copco 1.

Alternative 3 would provide similar long-term benefits when compared with Alternative 2, but would reduce short-term impacts because it involves less construction. Alternative 3 would result in superior long-term beneficial environmental effects. In summary, Alternative 3 is considered the environmentally superior alternative among all the alternatives because it provides long-term beneficial environmental effects, while reducing some of the short-term significant effects of the Proposed Action (Alternative 2).

5.7 Controversies and Issues Raised by Agencies and the Public

CEQA requires disclosure of the controversial project issues raised by agencies and the public. Table 5-5 presents a summary of some of the most controversial project issues identified during the scoping period. In the case that an issue or controversy is not directly addressed in this EIS/EIR, the table describes the process and general timeline for analyzing or addressing the issue. The Scoping Report (available online at: http://klamathrestoration.gov/) provides further information on issues identified by agencies and the public during the public scoping process.

Table 5-5. Summary of Controversies and Issues Raised by Agencies and the Public

Issue	Summary of Issue	Timeline for Addressing or Document/Section Addressing Issue
Loss of Renewable Power Supply	Loss of the Klamath Hydroelectric Project will result in the loss of renewable power. The specific makeup of new power supplies is not certain and may come from non-renewable sources.	Greenhouse Gases/Global Climate Change (3.10.4.3) Public Health and Safety, Utilities and Public Services, Solid Waste, Power (Section 3.18.4.3)
Regional Economic Impacts	Loss of the Klamath Hydroelectric Project and lost power generation will negatively and disproportionally affect resource-based economies of local communities, many of which are struggling economically.	Socioeconomics (Section 3.15.4.3)
Sediment Impacts from Dam Removal	Sediment release during dam removal will have significant and deleterious effects on the aquatic environment from Iron Gate Dam to the Pacific Ocean during the period of dam removal.	Water Quality (Section3.2.4.3) Aquatic Resources (Section 3.3.4.3)
Historic Anadromous Fish Distribution in the Upper Klamath Basin	Dam removal would open large areas of the Upper Klamath Basin watershed to anadromous fish. The historical distribution of anadromous fish above the dams has been questioned.	Chapter 1, Introduction Aquatic Resources (Section 3.3.4.3)
KBRA Benefits	The KBRA may not produce enough social and economic benefits from implementation.	Socioeconomics (Section 3.15.4.3)

Table 5-5. Summary of Controversies and Issues Raised by Agencies and the Public

Issue	Summary of Issue	Timeline for Addressing or Document/Section Addressing Issue
Loss of Reservoir Environment	Dam removal will result in a loss of the three largest reservoirs, affecting individuals that live on or near the reservoirs and who value the reservoirs' aesthetic and recreational value.	Land Use, Agricultural, and Forest Resources (Section 3.14.4.3) Scenic Quality (Section 3.19.4.3) Recreation (Section 3.20.4.3)
Flood Risk	Dam removal will increase the incidence and magnitude of flooding to downstream communities.	Flood Hydrology (Section 3.6.4.3)
FERC Relicensing	In the event of a negative Secretarial Determination, PacifiCorp would re-enter the FERC relicensing process. The outcome of this process is not known but could be the continued operation of the dams under a new license that includes the agencies' mandatory conditions and prescriptions.	Chapter 2, Proposed Action and Description of Alternatives
Agriculture and Refuge Management contributes to poor water quality in Keno and Upper Klamath Lake	Runoff from agriculture and refuges results in poor water quality in Keno Reservoir and in the mainstem Klamath River. This causes fish stress, disease and mortality. Continued farming and ranching in the Tule Lake National Wildlife Refuge and Lower Klamath Lake National Wildlife Refuge under the KBRA would inhibit fish species reintroduction and survival.	Water Quality (Section 3.2.4.3) Aquatic Resources (Section 3.3.4.3)
Water Quality Conditions in Keno and Upper Klamath Lake would not allow sound fish passage.	Low levels of dissolved oxygen and high water temperatures during certain times of year would prohibit passage of fish through Keno Reservoir and Upper Klamath Lake.	Water Quality (Section 3.2.4.3) Aquatic Resources (Section 3.3.4.3)

5.8 References

California Air Resources Board (CARB). 2008. Climate Change Scoping Plan: A Framework for Change. December. Accessed on: March 22, 2011. Available at: http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm.

Department of the Interior (DOI). 2011. Dam Removal Real Estate Evaluation Report. Prepared as an appendix to the Klamath Facilities Removal Secretarial Determination Overview Report.

Philip Williams & Associates, LTD. (PWA). 2009. A River Once More: The Klamath River Following Removal of the Iron Gate, Copco, and J.C. Boyle Dams. Prepared for the California State Coastal Conservancy. April 17.